Better Crops

The Pocket Book of Agriculture.

March 1927 10 Cents

de: Duplication — Better Muck Crops — Unbending
ks in Farming — Corn Economics — Missouri

Look Backward--Then Ahead!

BEFORE you start work on your next potato crop, look back a moment at your last year's results.

Were you satisfied with your yield per acre? Was your production cost per bushel low enough to give you a good profit? Did you get a lot of firsts or were there too many culls? Did your crop suffer badly from disease, insect attacks or frost injury?

If your crop was poor in any of these respects, this is the time to decide how to make your next crop a better one.

It will pay you to look into your rotation, your seed, and preparation of your seed bed, and also into feeding your crop plenty of potash in the form of a well-balanced mixed fertilizer. For potash helps to increase yield, strengthens the vines, aids starch to form in the tubers (a big factor in quality) and assists the plant to better fight disease and insect attacks, and to withstand frost.

It is important to check up on the actual number of pounds of potash which your crop receives. Good profits have been made when 80 to 150 lbs. of actual potash was supplied per acre. These amounts can be had in 800 to 1,500 lbs. per acre of a high analysis fertilizer containing 10% potash; in 1,000 to 1,875 lbs. per acre of an 8% potash mixture; or in 1,600 to 3,000 lbs. per acre of a 5% potash mixture. Many successful growers specify sulfate of potash in their fertilizer because of its favorable effect on quality of potatoes.

FREE—Lots of useful information about fertilizing on potatoes is contained in our booklet "Better Potatoes." Write for a free copy today.

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POTASH

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME VIII NUMBER ONE

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Over on the East Side, showing how some of the farmers' crops are disposed of in New York City.

Better Crops

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VOL. VIII NEW YORK, MARCH, 1927 No. 1

¶ *Jeff discusses the tragedy of*

DUPLICATION

By

Jeff McDermid

TWENTY "Broadway Limited" trains roaring their way to Chicago, all abreast, and each on a separate track! In each train sit ten passengers, some looking out of the windows, others reading.

What a picture! Purely imaginative, of course. But if a man from Mars, visiting us, should see this sight he might make a suggestion.

It would be this: Why this useless duplication? Why not one train instead of twenty—with the two hundred passengers in that single train? It would save the expense and useless energy of nineteen engineers, brakemen, conductors and millions of pounds of coal. Besides, the two hundred would be more company for one another, if all in one train.

The tragedy of duplication! We do not have twenty "Broadway Limiteds," but there are no less than five good railroads running splendid trains from New York to Chicago.

And all through our commercial and social life, due to what we inanely call our "competitive" system, can be found countless examples of foolish duplication.

Start wherever you will. Observe the nearest city. Will you not find there five hotels? And is

it not true that they each require a kitchen, a manager, a room clerk, and a heating plant?

Why not *one* hotel? Certainly, if you combined the facilities of the five under one roof the resulting hostelry would be better than any of the five it replaced; for its overhead cost, spread over five times as many guests, would automatically make it possible to lower the rate per room.

Or for one more example out of thousands possible to present, analyze the distribution of groceries, and you will note that, for every two hundred and fifty people in a given city, there is a grocery store. Think of it! Over four hundred thousand grocery stores serving a population of a hundred and ten millions—a grocery to every sixty families in this country!

In a city of twenty thousand we will ordinarily find a hundred grocers. The six thousand families, making up the population of that city, *support* those hundred grocers—support them by what actually becomes an unwarranted *tax* of a certain number of cents on each dollar spent for food.

It would not be possible to serve the community properly with *one* store; but certainly *five,* strategically located, could render satisfactory distributive service to a populace of a city of twenty thousand.

And says our visitor from Mars, to eliminate ninety-five *rents,* ninety-five electric bills, and all of the other ninety-five expenses, would most certainly *reduce the cost of* food, perhaps cutting the cost a fourth—and put ninety-five men to work *producing,* instead of *selling.*

Back in the naive decade a certain Bellamy wrote a book, "Looking Backward."

In it he dreamed a dream and, for the purpose of his narrative awoke in 1950 to relate what he found in that year in this country.

A miraculous change had been wrought. The competitive system had been abolished by national consent; and, while in 1890 when he went to sleep there were many stores of all kinds, *now there was but one in a city,* which offered every need of every citizen, and it was only a show-room!

If you wanted, say, a broom, you merely went to this store, or show-room, selected your broom from a row of assorted samples and went back home. By the time you had returned the broom of your choice had arrived from the central city warehouse where it had been taken from a huge stock and shot to you underground by a pneumatic freight carrier.

A dream! But Bellamy thought more clearly than he knew. He sensed the tragedy of duplication keenly—and to show how monumentally silly was our so-called competitive system, he pictured this Utopia of 1950, in which all but *one* of everything had been eliminated.

We may reach, in some future age, the realization of Bellamy's dream—but it may not come solely through government action, as Bellamy foretold. Instead, it perhaps will arrive, if at all, as a result of a slow, but certain awakening of intelligent people to the economic tragedy being enacted before their eyes: an awakening that can only come when men —more men—are "socially minded," alive to their responsibility to the coming generations, and put in motion plans to *regulate* unwarranted, uneconomical duplication.

Man has progressed in great, breath-taking strides from the days when each grew his own food, made his own clothes and erected his own shelter.

Our distributive system—from the time the first shoemaker, about

(*Turn to page 62*)

Winning with Rabbits

By

Allyn H. Tedmon

County Agent, Arapahoe County, Colorado

Charley Campbell at work

CHARLEY CAMPBELL was born and raised in West Virginia. At the time the war broke out he was in Denver where he entered the Service. He served overseas as an automatic gunner, E Company, 354th Infantry, 89th Division. In October, 1918, he was gassed at the front in the Meuse-Argonne battle. Charley received medical assistance, but at present is receiving nothing from Uncle Sam, even though he is one of the most deserving, and his poor health would warrant anything within reason being done for him.

This little story can only hint at what this man of nerve has done. When he again landed in Denver after his service, his health terribly impaired and with nothing in view, he did not stand still. As soon as possible he enrolled in the vocational work being given at the Colorado Agricultural College at Fort Collins, where he took up the study of poultry husbandry.

After his year's work here, he gathered together his few possessions into an old Ford roadster, and landed on his present homesite, near Denver. Here another year of placement training was given him, during which he got on his feet a little.

From the start he had the care of a motherless daughter, and as working capital only a few White Wyandotte hens and a number of rabbits. This stock was carried on and gradually increased until today he has about 100 hens in his flock which are trap-nested and blood tested. In his rabbit yard are between 65 and 70 does, most of which are well bred, and many are pedigreed. His main output from the rabbit hutches has been meat rabbits.

The whole story never would have been played had it not been for the rabbits. Denver is a fine meat rabbit market, and due to

(*Turn to page* 43)

Better Muck Crops

By S. D. Gray

An article full of authoritative data for the muck farmer

THE profitable use of peat and muck lands is a subject of unending interest in the States bordering on the Great Lakes, the Atlantic and Gulf Coastal Plain and the Pacific Coast.

In these regions there are approximately 90,000,000 acres of reclaimed swamp land. It is essential, therefore, that the problems be considered seriously, that the relationship of the various conditions and factors involved in the cropping of these soils be thoroughly understood.

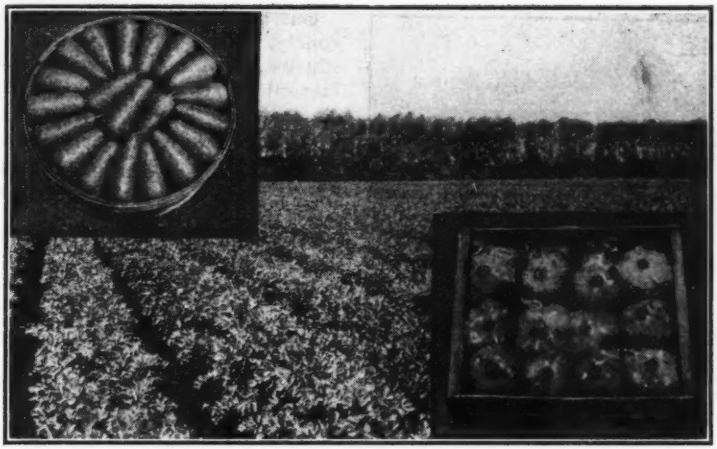
Peat and muck soils are formed in swamps or shallow lakes and are merely undecomposed plant remains mixed with a smaller quantity of the mineral soils. Muck is composed of the same materials as peat but it has gone through a longer period of decay. The selection of desirable types of peats depends upon many factors, the most important of which are materials from which they were formed and the stage of decomposition. The principal types of peaty soils are: turfy, fibrous, earthy, sandy, marly peats and mucks. Of these mucks have the highest agricultural value; marly sand and earthy coming next in value, in the order given. Turfy and fibrous peats are difficult to cultivate and are seldom used for crops other than pasture grasses.

Whether or not any bog will pay depends upon the care exerted by the farmer in the selection of his bog, money expended in reclaiming and draining, section of crops suited to his soil, proper attention to fertilization, and protection from wind damage.

In every state where there are important muck areas the state agricultural experiment stations have made a careful study of these problems. Farmers, therefore, should secure the services of the state experts before undertaking muck land farming. To consult them may save considerable money.

The work needed to prepare a bog for cropping varies. Some bogs may be so rough that it is best just to remove the undergrowth, drain with open ditches, and use for pasture. The best time for clearing is when the surface of the bog is frozen. In clearing the undergrowth a useful implement quite frequently employed is the tractor. Experience of farmers who have used the tractor shows that this method is quite effective and economical.

ON the best peat and muck soils enormous crops of onions, potatoes, sugar beets, celery, lettuce, and in fact most other crops adapted to the general region can be grown, provided the factors limiting production, namely: fertility, water supply, and climate are taken into consideration. The crops that may prove most satisfactory will depend upon local climatic condi-



Peat soils are among the best of all soil types for the production of high grade vegetables and other crops

tions, markets and the special adaptability of any particular bog to the crop.

There are many crops that require lime for best growth. The amount of lime to be applied in all cases depends upon the degree of acidity and the lime requirement of the crop or crops to be grown.

The following list shows what crops are adapted to low-lime or sour soils and high-lime soils:

Crops adapted to low-lime and sour soils: Blackberry, blueberry, buckwheat, castor bean, cowpea, cranberry, crimson clover, hairy vetch, millet, potato, radish, raspberry, redtop, R. I. Bent, rye, soybean, strawberry, sweet potato, turnip, velvet bean, watermelon.

Crops adapted to medium and high-lime soils: Alfalfa, barley, cabbage, carrot, cauliflower, celery, corn, cucumber, currant, egg plant, kohlrabi, Ky. blue-grass, lettuce, mangel beets, mint, oats, okra, onion, parsnip, peanut, pepper, pumpkin, red beets, red clover, salsify, sorghum, spinach, squash, sugar beet, timothy.

When peat and muck soils are first reclaimed small applications of manure frequently give good results. Generally speaking, many applications should be made only on soils just being brought into crop with light applications; thereafter at periods of three to four years. The principal value of manures is their beneficial action on bacterial life in muck soils.

Experimental work shows the outstanding need of peat and muck soils to be potash. These soils are well supplied with nitrogen and when first reclaimed ordinarily have enough phosphoric acid for satisfactory crop growth. After a few years' cropping, however, it may be necessary to supply both phosphoric acid and potash.

Proper fertilization not only increases yields but improves the quality of crops. Recent experiments in Michigan show that both phosphoric acid and potash, especially potash, tend to increase the sugar content.

Potatoes grown on muck soils, properly fertilized with potash, are just as good in every respect as potatoes grown on mineral soils.

A tractor pulling plows which are converting wild land into arable acres

Practical farmers say that fertilized hay from muck has more heart. These farmers also indicate that animals prefer to graze on fertilized areas, which would seem to indicate that such grasses are possessed of superior quality.

Large areas of corn, wheat, oats, rye and barley are successfully grown on peat and muck soils. Wheat, however, is very easily winter-killed and is, therefore, not considered a satisfactory crop.

Corn is one of the best indicators of the lack of potash, dwarfed, leaning stalks of a sickly color with no ear or with shrunken kernels on a nubbin ear being a very sure sign of potash hunger.

On the farm of George M. Calvin, Kewanee, Ind., an application of 100 lbs., of sulfate of potash increased the yield from 20.7 bushels of poor quality to 54.4 bushels of sound corn per acre.

On another farm in Berrien county, Mich., an application of 200 lbs., of muriate of potash increased the yield from 14 bushels to 60 bushels per acre.

The fertilizer requirement of the four small grain crops above mentioned is similar. Fertilizer mixtures containing from 2 to 3 per cent nitrogen, 8 to 12 per cent phosphoric acid and 12 to 32 per cent potash give profitable returns.

Another crop which has proven quite satisfactory on newly broken peat or muck soils is flax. This crop is a good soil conditioner. In general a mixed fertilizer containing 8 to 12 per cent phosphoric acid and 12 to 24 per cent potash is recommended.

In the early stages of reclamation of peat and muck lands, especially on fibrous and turfy peats, forage crops such as alfalfa, clover, soybeans, timothy, millet, Kentucky blue grass, red top and rape are profitably grown.

Alfalfa is adapted to high-lime peats and mucks. Muriate of potash is often all that is needed, but satisfactory results are frequently obtained from use of a mixture containing 8 to 12 per cent phosphoric acid and 12 to 24 per cent potash.

The clovers with the exception of crimson clover also require a high-lime soil. The following table gives results of experiments with clover on muck soils in three locations in Michigan.

(*Turn to page* 58)

Treatment	Eaton County Tons per acre	Ingham County Tons per acre	Allegan County Tons per acre
No fertilizer	1.6	1.0	2.2
300 lbs. acid phosphate	1.5	1.2	2.0
300 lbs. muriate of potash	2.3	2.5	2.5
300 lbs. muriate of potash and 300 lbs. of acid phosphate...	2.7	2.5	2.5

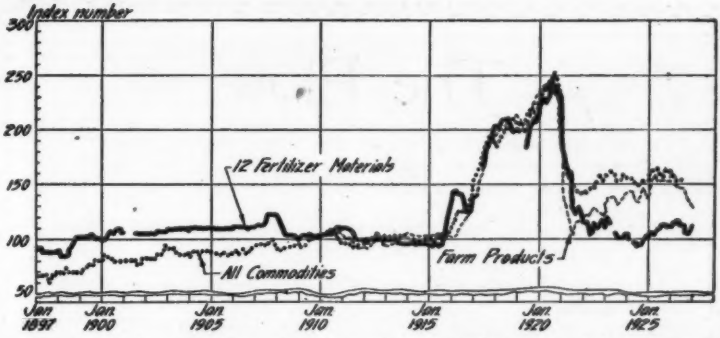


Fig. 1. Index numbers of prices of 12 fertilizer materials, all commodities, and farm products. The index number of fertilizer materials is now lower than all commodities and farm products.

Fertilizer Prices

By G. J. *Callister*

THE agricultural depression has been characterized by noticeable fluctuations in total fertilizer consumption. One of the primary causes of these fluctuations is the price of farm products. However, the price of fertilizer materials is also an important factor affecting consumption.

It is particularly gratifying, therefore, to find that since the war the price of fertilizer materials has been below the general level of wholesale prices of all commodities, and, further, many fertilizer prices are also below the level of farm prices in the United States.

An exhaustive study of the "Index Numbers of the Wholesale Prices of Fertilizer Materials" since 1897 has been made by E. E. Vial, and the results published in the February number of "Farm Economics," Department of Agricultural Economics and Farm Management, New York State College of Agriculture, Cornell University.

The monthly wholesale prices of 20 fertilizer materials were tabulated. A weighted index number of the prices of 12 fertilizer materials was prepared from these prices.

As pointed out by the author, "the most striking features of the index numbers of prices of 12 fertilizer materials is the comparative stability for the 16 years, 1900-1915; the rise during inflation, 1915-1920; the collapse with deflation, 1920-1921; and the comparative stability at low prices, 1922-1926."

It is very interesting to note that one of the causes for the rapid growth of fertilizer tonnage for the 15 years, 1900-1914, was be-

(*Turn to page 54*)

The Plow

From Egypt behind my oxen, with their stately step and slow,
Northward and east and west I went to the sand and the snow;
Down through the centuries, one by one, turning the clod to the shower,
Till there's never a land beneath the sun but has blossomed—behind the power.

I slide through the sodden rice-fields with my grunting, hump-backed steers,
I turned the turf of the Tiber plain in Rome's imperial years;
I was left in the half-drawn furrow when Cincinnatus came,
Giving his farm for the Forum's stir to save his nation's name.

Over the sea to the north I went; white cliffs and a seaboard blue;
And my path was glad in the English grass as my stout, red Devons drew;
My path was glad in the English grass, for behind me rippled and curled
The corn that was life to the sailormen that sailed the ships of the world.

And later I went to the north again, and day by day drew down
A little more of the purple hills to join my kingdom brown;
And the whaups wheeled and to the moorland, and the gay gulls stayed with me
Where the Clydesdales drummed a marching song with their feathered feet on the lee.

Then the new lands called me westward; I found on the prairies wide
A toil to my stoutest daring and a foe to test my pride;
But I stooped my strength to the stiff, black loam, and I found my labor sweet
As I loosened the soil that was trampled firm by a million buffaloes' feet.

Then farther away to the northward; outward and outward still,
But idle I crossed the Rockies, for there no plow may till,
Till I won to the plains unending, and there on the edge of the snow
I ribbed them the fenceless wheat fields, and taught them to reap and sow.

The sun of the Southland called me; I turned her the rich brown lines
Where the paramatta peach trees grow and her green Mildura vines;
I drove her cattle before me, her dust and her dying sheep,
I paintd her rich plains golden, and taught her to sow and reap.

From Egypt behind my oxen, with stately step and slow,
I have carried your weightiest burdens, ye toilers that reap and sow.
I am the ruler, the king, and I hold the world in fee;
Sword upon sword may ring, but the triumph shall rest with me.

—Will H. Ogilvie in London Spectator.

—Courtesy Oliver Chilled Plow Works

Plowing began by subjecting slaves to the very laborious task of pulling the plow

Unbending Backs *in* FARMING

By M. L. Hopkins

Madison, Wisconsin

¶ *No. 6 of this series*

THE plow goes back, with man, through the centuries. Through his writings we find how dependent man has been upon this humble tool of the earth and how about it he has ever woven a fabric of symbolism.

In Holy Writ reference to the plow is made again and again. Take an early one and see how substantial was the regard of the men of Bible times for the beasts and the tools which helped so much to feed and clothe them.

"And there came a messenger unto Job, and said, 'The oxen were plowing and the asses feeding beside them; and the Sabeans fell upon them, and took them away.'"

Nor was the messenger's concern at all strange when we realize the dependence then as now upon the oldest agricultural implement—the plow.

Systematic agriculture began when man first took his crude war club and with it stirred the soil. Although history does not give the date of the first plow, the earliest

records show that it was an implement used in the preparation of the soil for the harvest crop. However, it is not unlikely that in the very beginning, men soon noticed that loosened earth produced more abundantly. It is just possible that the snout of the wild boar, grubbing, gave our primitive ancestors a suggestion for the shape of an instrument with which to stir the soil. For history tells us that the early plow and "rooting" end of the wild hog bore a striking resemblance.

Because primitive man was unaccustomed to toil, he yoked his womankind to the plow. Later with natural crooks of tree branches for plows, he pressed into service the cattle grazing on the hillsides. The ease with which this plow loosened the ground as compared with the muscle straining drudgery pointed stick overwhelmed the superstitious savage.

Fully, 3,000 years before the Christian era, the Egyptians had developed a plow with a broader, triangular share to make a wider furrow than the tree crooks of Asia Minor. An iron plate, covering part of the wood, made the plow more effective than any previously designed. All plows, up to this time were merely instruments to pulverize the soil by passing through and disturbing it in its place.

It's a long jump from early Egyptian days to the time when the peoples of Britain and America turned their genius to the perfection of tillage tools but apparently man, in those centuries, was quite willing to let well enough alone. Perhaps no great strides were made in the development of the plow and of plowing until our own forefathers set about the task.

We are told that the very first plow patent ever granted, was issued in 1700 in England. James Small had the privilege of manufacturing the first all-iron plow in Scotland about 1765, while between 1790 and 1796, Charles Newbold built and patented the first all iron plow in America. But because farmers held the strange notion that the cast iron injured the soil, he was forced to abandon it.

The colonial wheeled plows of 1748 were both clumsy and short, plowing neither deep nor straight. The wheels were thick as cart wheels. Until the beginning of the nineteenth century, plows were made by the most unqualified artisans. All of the plows did their work slowly and imperfectly.

The art of plow making was subject to continual changes, for each generation produced new ideas upon the art. New ideas died with their originators, just as a good plow might be produced today and end in failure the next, chiefly because definite knowledge and plans were lacking.

To state just when the first plow was invented is impossible, but his-

More than 125 years old — the American colonists employed this type of plow to turn the soil.

—Courtesy Oliver Chilled Plow Works

tory does record that few did more than Thomas Jefferson, farmer, statesman, and President of the United States, to promote the art of efficient plow making, for it was through his efforts that it was placed upon a scientific basis.

Through Jefferson's journals, we learn that he first became interested in plow improvements in 1788 while traveling through France as American Ambassador to France. Noticing the crude mold-boards on the plows of the natives, there aroused in him a desire to perfect an efficient plow. That interest lead to scientific drawing and planning.

In 1793, Jefferson put his theory to the test of practical experiment by using on his Virginia plantation several plows made after his patterns. The mold-board, being made according to scientific principles, enabled workmen in various parts of the country to form their mold-boards exactly alike. Jefferson's contribution was one of the most valuable factors toward perfecting the plow.

September 1, 1819, marks the date of Jethro Wood's patent on the first modern plow. He made a light iron plow, on which the pressure of the furrow was evenly distributed over the surface, so that the wear was equal on all parts. More important than that, however, was the interchangeability of parts which he made possible. The replacement of broken or worn-out casting brought about the era of plow manufacturing as contrasted to that of plow building in small quantities by local carpenters, blacksmiths, and plowwrights. It was his light plow that helped to drive out of existence countless clumsy plows.

Because of his thoroughness, Daniel Webster became interested in planning a plow that would be capable of plowing a deep furrow. As a result, he constructed an enormous implement, measuring 13 feet in length and capable of turning a furrow a foot deep and two feet wide.

The wheel plow has been developed during the last 50 or 60 years. In 1844, H. Brown combined several plow bases into a gang supported on wheels, but it was not until 1864 that a successful gang plow was patented by F. S. Davenport. The invention is largely an American one.

(*Turn to page* 57)

With the development of large farms, manufacturers were soon called upon to build larger plowing units

Showing diplodia mold on corn. Note the matted down appearance of the husk. In the third ear no mold was visible, but it showed up badly in the tester

Testing for

By A. A. Burger

Cedar Falls, Iowa

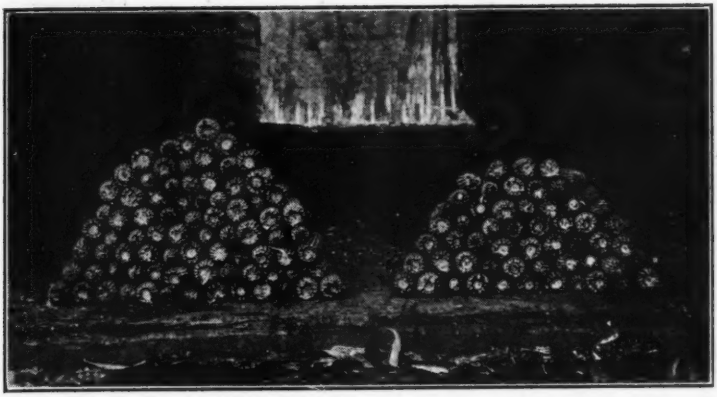
"THAT'S another new scare that you have now to get us to test our seed corn! Last year you told us a lot of our seed corn wouldn't grow because it was frozen before it had a chance to dry. This year I picked all of my seed corn early, and put it up on racks in the attic. It's dry as a bone now! I'll bet I'll have a good crop of corn next year if nothing happens."

My friend Mikkleson did not explain to the county agent that he had not thought enough of his advice last year to test his corn. Just the same he replanted his entire crop. For the second planting he used imported seed that didn't mature. Rather an expensive lesson for him, but he wouldn't admit it. That, of course, was none of the county agent's business.

But Mikkleson wasn't looking for advice—not from the county agent. He just happened to step into the office with his neighbor who was of the type who took more stock in modern methods, and in new ideas of farm practice. He always thought them over for himself, put them in practice if he thought they were workable and would pay. This fellow's name was Larson.

"So you wouldn't be interested in testing your corn this year," casually remarked the county agent who happened to be familiar with Mikkleson's situation, though he gave no hint of it.

"Nope, not on your tintype," replied Mikkleson.



Corn at left from yield of 69 bushels per acre, seed free from dry rot. Corn at right, from seed slightly infected with dry rot, yield—65 bushels per acre

Diplodia Rot

An argument which proved some valuable points

"How was your corn this year?" inquired the agent.

Mikkleson never let on. "Purty good," he said, "but there was lots of spoiled and rotten ears in it. Nothin' to be done for that. I reckon these rains this fall caused it. You bet I didn't plant that kind of seed . . . why you should have seen my seed corn, not a moldy kernel in it. You know everybody had to throw out a lot of rotten stuff this fall."

Mikkleson was trying to belittle the argument for testing. He didn't know that he was playing into the hands of the county agent.

"Guess you are right about the moldy corn," continued the agent, "there was a lot of mold this year everywhere that corn was grown. The bad thing about it is that it is on the increase. We never have had so much of it in the corn belt before. We've not paid the attention to it that it deserves. We ought to do more to check it."

"While I am here," said Larson, I want to pay my Farm Bureau dues. The agent turned to his assistant and asked for the membership record book.

"You paid your membership dues quite a while ago, didn't you, Mr. Mikkleson?"

"Yes I did, several years ago"—he squirmed around uncomfortably in his chair—"but the Farm Bureau never done nothin' for me so I quit."

"Sorry about that, Mr. Mikkleson, but we would be glad to have your name on the list of members again. How many acres did you have in corn this year?"

"About 50," replied Mikkleson.

"Your acreage is about the same as the corn acreage for the average

farm in the state. Would you think it would pay you to test your corn this year if you could increase the yield 200 bushels, or perhaps more—an average of at least four bushels more per acre? You likely threw out that much moldy corn this fall, or perhaps left that much of the spoiled corn in the field. Every farmer knows that this moldy corn is worthless as a feed, and in the crib helps to spoil the other corn."

"Of course I'd test! I'd be foolish not to. But what's that got to do with mold? My corn is 100 per cent stuff, picked before the frost, dry. It's real stuff. Don't want to waste time testing. Too much work for me—all foolishness."

The county agent had heard similar arguments before. But Mikkleson betrayed his inner thoughfs. I imagined I could hear him saying, not me! test and join the Farm Bureau?—no, I'm too shrewd and foxy for that.

The wood strip tester is convenient for detecting mold

Larson spoke up: "You say it doesn't pay to test? You should have been over at my place when we had the demonstration. I tested all of my corn and it was 100 per cent stuff too. But I had lost a lot of corn by dry rot, the disease that was in your fields this year. We wanted to find out whether we could check it by testing."

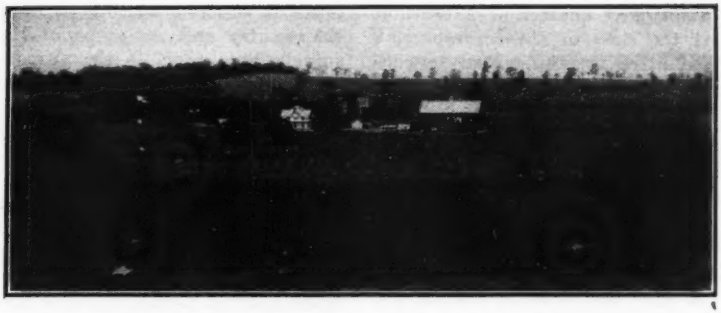
The county agent brought in some specimens of the corn plant showing the disease at the roots, on the stalks, in the shanks, and in the ear. He explained that the disease might occur at any point of the corn plant but that it was most prevalent on the joints of the plant and the butts of the ears.

"Do you know that "dry rot" (Diplodia zeae) causes a loss in this state estimated at 17,000,000 to 40,000,000 bushels? These are not guesses. The estimates are based on experimental evidence. It has been shown that the disease reduces the viability of the seed by about 14 per cent. It seems to kill or weaken the seed, it dwarfs the plants and molds the ears until they are unfit for feed. Another bad thing about dry rot is that it may affect the ears in such a way that it cannot be detected except by a thorough test. In the test the mold will show up."

"That's right," said Larson, "you couldn't see any mold on the ears I saved for seed. But it surely showed up in the test. We planted one plot of corn that showed no mold in the test; in another we planted corn where the test detected the mold; in a third plot we planted the corn just as it was before we tested it for mold. The last sample was designated as 'farmer's' corn."

"We got the best stand and the most vigorous corn in the plot planted to the healthy seed, at

(*Turn to page* 44)



Definite plans have been made for Virginia's old homesteads.

Agricultural Programs

By C. E. Trout
United States Department of Agriculture

THE county agricultural agent's dream of a definite plan for the agricultural development of his community is becoming a reality as one of the important rural improvement movements throughout the country. States are working out programs, not only for a year or a season, but for five years, 25 years, and in some cases they call them permanent programs. Counties are following the states, and other units, such as a special region, are falling in line. From Oregon to New Jersey, from New Orleans to Fargo, agricultural programs are holding the attention of farm leaders.

As the various programs have been developed, leaders have come to recognize that definite, detailed information about all factors affecting the agriculture of the area is the essential starting point. Not only a collection of all available data, but special detailed surveys of the region are now usually included in the preliminary arrangements. Both the plan worked out and approved by the leading interests in the section and the compilation of authentic and comprehensive data are unexcelled tools for the use of the county agent and the Extension Service.

The idea of a state program seems to have been given its first definite start by Illinois in 1922. Conditions in the State College of Agriculture and the Experiment Station made it necessary to work out new plans for those institutions. In view of these needs and the agricultural depression then at its worst, the president of the University, David Kinley, called a conference of agricultural leaders of the state to review the development during the previous 25 years and try to frame the main outline of a general policy of agricultural development for the state

in the next quarter of a century. At the close of the conference, a committee was appointed to consider the different phases of the problem and report whatever proposals and recommendations appeared to be helpful in determining the direction of the agricultural development of the state.

THE first state program was completed by Oregon. In October, 1923, the Oregon Agricultural Extension Service published a bulletin under the title, "An Agricultural Program for Oregon." It was the work of Paul V. Maris, Director of Extension, and, he says, the information upon which it is based was the outgrowth of numerous conferences with the various specialists of the Extension Service and the Experiment Station. He states that he assembled and organized the material with a view to contributing to what is conceived to be a present need in the state. As it was prepared entirely by the extension force, this program differs from the Illinois idea and from the later developments in other states. However, the Oregon state program was followed up by economic conferences in various counties where county programs were worked out by local leaders cooperating with the Extension Service.

A survey of the market outlets for farm products and the production possibilities of the locality as a basis for a program was started in Blair county, Pennsylvania. The survey was made by R. Bruce Dunlap, County Agricultural Agent, Burke H. Critchfield and M. V. Carroll of the Bureau of Agricultural Economics, United States Department of Agriculture. Various state and local agencies interested in agriculture cooperated in this survey. It has been followed by others in various parts of the country and the scope of the surveys has grown to the proportions of the New Orleans Trade Area Survey which included the southern half of Mississippi and almost the entire state of Louisiana.

While it has been used most extensively for the trade area of a city or for a restricted region, the survey is also getting wider trials. Idaho now has a state survey under way which is to be used as a basis for a state program for agriculture. In these surveys which are usually made cooperatively by the local agencies, the state Extension Service, and the United States Bureau of Agricultural Economics, the county agent has been the key man in getting at the basic details which the farmer must furnish. Usually he has been a leader in the movement for a survey and program as he most clearly sees the need and advantage of such work.

A fertile soil and the need to maintain the fertility of the soil is recognized in the programs directly and indirectly, as fundamental in agricultural progress. The program of even the young state of Oregon where soil fertility is not a pressing problem as it has become in older states, refers to the need of recognizing the soil problem in a statement as follows:

"It is not within the scope of this publication to consider practices of production except as they relate in a general way to our problem of marketing, but a summary of the possibilities of expansion and development would not be complete without reference to the increase in the volume of our agricultural production that may be obtained by better soil management, proper use of fertilizers, use of improved strains of seed, better cultural practices, etc. These are factors largely within the control of the individual and none but he who is

ceaselessly diligent in their mastery is likely to prosper under any system or combination of circumstances that may be obtain."

As we would expect, the eastern and southern states with their more badly worn soils have given more direct emphasis to fertilizer needs. Virginia has a five-year program worked out by the Virginia Agricultural Advisory Council. This Council is composed of representatives of all organizations and institutions interested in the agriculture of the state. Several counties, under the leadership of their county agents, have also worked out five-year programs under a county council system. The state program contains a statement of the fertilizer needs of the state in these words:

"Since in certain sections of Virginia the proper use of fertilizers absolutely govern the profitable production of cash crops, the Committee recommends that an intensive campaign be conducted during the whole five-year period by every agency interested in Virginia's agricultural development for the purpose of increasing the knowledge of our farmers regarding the principles underlying the use of fertilizers and acquainting them with the results of fertilizer experiments already completed."

In addition, the Virginia program mentions the fertilizer requirements of various crops under the special discussion of each one. It points out the large part played by fertilizers in producing high quality tobacco and recommends that the results of fertilizer tests be given wide distribution. It gives fertilizer formulas for use on cotton and recommends that 300 to 600 pounds be used per acre. Typical county programs state that, "A fertile soil is the basis of successful agriculture." They recommend definite methods of maintaining fertility which include the use of high analysis fertilizer.

In Arkansas the state workers prepared a state agricultural program which was printed as a tentative program for the people of the state to consider. The plan is to hold a state-wide conference to discuss this program and adopt a permanent form. The tentative program says, "The prosperity of agriculture in any state is determined largely by the capacity of the soil to produce. Better production must, therefore, start with better soil management."

A PERMANENT program of agriculture was adopted for Alabama during January, 1926, by the Alabama Extension Service, Experiment Station, State Department of

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County and state plans help determine the future of Oregon's new farms.

Baby foxes ready to grow into value.

Treasure

By
V. V. Hostetler
Covina, California

THE same glamour of adventure and romance centers about silver black fox furs as around pearls, diamonds and sables. Ever since furs have been taken from the wild for the commercial market the silver black fox fur has been the most valued and through the Middle Ages, because of its expensivenesss, it was barred from all except members of royalty.

This fur, the price of which exceeds that of sable, owes its value to its rarity and the impossibility of imitating its loveliness. The "under fur" is a dark, slate blue pierced by the longer metallic "guard hairs" of black which are barred with silver about an inch from the tip.

Prior to the World War, London was the fur market of the world and in the years 1910-1913 on an inflated auction market rare specimens of the silver black fox were sold at $2,500-$2,700. The present market price for skins of good quality is from $300 to $500, with pelts of exceptional beauty bringing as high as $1,000.

Originally the silver black fox was a "sport" and not a species of the fox family. This freak of nature, the silver fox, has never been found in its wild state except on Prince Edward's Island which is a territory less than 135 miles in length.

It is the theory of naturalists that as the fox families were pushed back by civilization or climatic conditions on Prince Edward's Island the cross foxes and the red foxes interbred and a small per cent of the progeny were silver black foxes.

Forty-two years ago Sir Charles Dalton conceived the idea of breeding these rare animals in captivity on Prince Edward's Island. After several years he was successful in trapping two pairs of silver black foxes and from these animals all the pure silver black foxes are descended.

Sir Dalton took into partnership Robert Oulton and four relatives and an agreement was formed whereby no live animals were to be sold. In this way the firm hoped to control the silver fox market of the world.

For some time all animals which reverted to the patch or the red

of the Wild

¶ *March is the anxious month for the fox farmer.*

The "finished" fox—an aid to beauty

fox strains were killed and only the silver black foxes were interbred. However, after the combine was broken in 1910, when one of the partners sold two pairs of the animals for $10,000, other members of the firm began to sell live stock and no attention was paid to the elimination of the less desirable animals.

For a few years the public of eastern Canada and the United States were exploited by promoters of the silver fox industry who sold the animals regardless of pedigree. The highest price recorded in this boom is $32,500 for 10 pairs of foxes. The only test of quality was the price of the pelts. During the World War the price dropped to pelt value and New York became the fur market of the world.

In 1921 George Brackett of Boston, Mass., acknowledged one of the greatest fur experts of the world, established a system of silver fox scoring which put the industry upon a substantial basis and proved an invaluable protection to the inexperienced investor.

The Government also became interested in the industry and maintains experimental stations throughout the country where biologists and chemists are employed to study every phase of the business. The Canadian government also has two experimental stations on Prince Edward's Island and another near Quebec. Annual government bulletins are issued containing the most authentic information for the breeders of foxes.

The industry now has passed through its stage of exploitation and inflation and has become stabilized by the Brackett scoring system and through the efforts of the International Fox Institute, the American Fox Institute and the Canadian National Live Stock Record which register the stock of all reputable fox farmers. The price has gradually increased and breeding animals are bringing per pair from $1,500 to $3,000.

Cold weather during December and January is an essential to fox farming as in these months the fur is "in prime" and attains its best color, thickness and length.

The fur from the fox farm is superior to that obtained from the wild because it is taken only when "in prime" whereas the fur from the wild animal is taken regardless

of its condition.

The best equipped farms are surrounded by woven wire fences and within these enclosures are the individual wire pens 10 by 50 feet with a wire carpet under the earth. Each pen has a kennel divided into two compartments, the outer for the male and the nest box for the litter. The fox is a monogamistic animal and keeps one mate through life.

The average breeding period is eight years. Foxes breed once a year and the young are usually born in March and are full grown in September. The litters are from two to eight with an average of four pups.

The scientific fox raiser pays the greatest attention to the food of his stock and each farm generally has its dairy and poultry and rabbit yards which furnish cream, eggs and fresh meat which form the chief items of the rations particularly in the gestation period.

Two or three days before the young are born the dam retires to the nest box and the sire keeps guard in the outer compartment. He refuses all food for himself but takes it to his mate. If eggs are put in the kennel he will run about with one in his mouth until he is unobserved and will then take it into the nest box. Only if it is broken will he eat it.

Sometimes with a very large litter the dam is unable to nourish all and the fox farmer is obliged to advertise for cats with young kittens. Strangely the cats are more attentive to their foster progeny than the fox dams, but the foxes raised by the cats are usually inferior. The milk of a cat, like that of a cow, has but three and one-half to four per cent butter fat while the milk of a fox is from seven and one-half to eight per cent butter fat.

After weaning their young the fox sire and dam eat only enough to sustain life, giving nearly all their food to their litter. Again science enters into the feeding at this period and every effort is made to supply the same food elements that the animal would obtain in its wild state. Ground bone, fish, vegetable porridge, and fox biscuits, which are similar to dog biscuits are provided for the developing litter.

If taken soon after weaning, at four or five weeks, the fox pup can be tamed and trained and will make as satisfactory a pet as a dog. For the purpose of advertising the business many fox fanciers train foxes to ride in their automobiles.

THE daily experience of fox raisers verify the well-known stories of the cunning and uncanny intelligence of the animals. There seems to be but one incident in his life with which Sir Reynard is unable to cope. It is the delight of the fox to lie on top of his kennel and let the snow cover him to the eyes and often in the sudden thaws and freezes of early Spring he finds his tail frozen to the kennel and is held a prisoner until released by the melting ice or a farm employee.

It is the common experience of fox raisers, when a pair of animals are to be separated, to find all the foxes acting as usual except the pair designated which will be hiding in their kennel.

As the public is learning more of the long and terrible sufferings of trapped animals a sentiment which will soon be a factor on the fur market, is being aroused in favor of the fur farms where only humane methods of killing are employed.

In Southern California a lively interest in fox farming has developed during the past three years.

(*Turn to page 56*)

Right—No fertilizer; yield 42.9 bushels corn per acre. Left—Complete fertilizer of nitrate of soda, acid phosphate, and muriate of potash; yield 76.5 bushels per acre; net gain $74.28 per acre above the cost, labor, and interest on investment in the fertilizer.

Corn Economics

By George L. Schuster

Agronomist, Delaware Agricultural Experiment Station

THE old saying "Corn is King" has been truthfully applied to the middle western states more commonly known as the corn belt states, but it must not be forgotten that corn is also "Crown Prince" in the middle Atlantic states. The corn of the middle Atlantic states does not enter into trade and commerce to any great extent. Only about 20 per cent of the crop leaves the county in which it is produced. The bulk of it is grown for a maintenance crop on the farm.

Economy of production is important here as in the production of other crops. The crop must be produced at a cost that is under the market quotation. The manufacturer of a commodity counts the cost to produce his article, adds a profit, and fixes the selling price, but this is not true in the case of the farmer and his corn. The only thing he has control of is the cost of production and he may not have complete control of that.

The writer has observed in his travels through the middle Atlantic states that the better farmers are practicing a definite system of farming, i. e., they have a definite

Corn grown continuously on farm land with an annual application of 125 lbs. of nitrate of soda, 250 lbs. acid phosphate, and 75 lbs. muriate of potash per acre. The average yield for 16 years has been 57.8 bu. per acre—78.3 per cent of which was sound. See illustration below.

rotation of crops for each field, and they manure, fertilize and lime regularly. They use high grade seed and prepare the seed bed thoroughly, and they study the markets as to the best time to buy and sell.

The Delaware Experiment Station has conducted long time investigations as to the effect of certain cultural practices on the economic production of corn on sassafras silt loam soil, a soil type that is generally adapted to the production of corn.

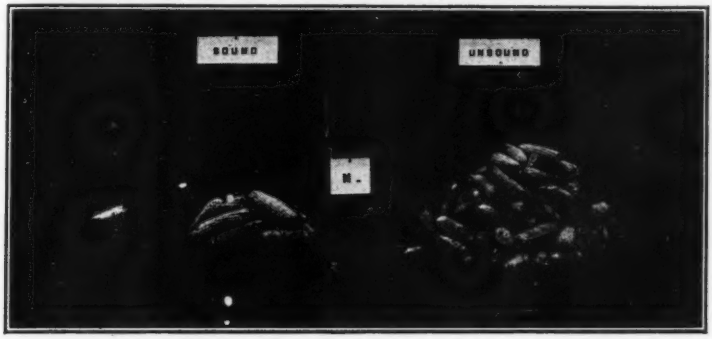
Corn has been grown in a rotation of 1. corn, 2. soybeans, 3. wheat, 4. clover and timothy sod for 16 years on one tract of land. On another tract it was grown continuously for 16 years. Each tract was divided into several plots and received various fertilizers and manure.

Where no fertilizer and manure were applied there was an average annual yield of 43 bushels per acre for the rotation, 60 per cent of which was sound; and a yield of 16.7 bushels, 28.6 per cent of which

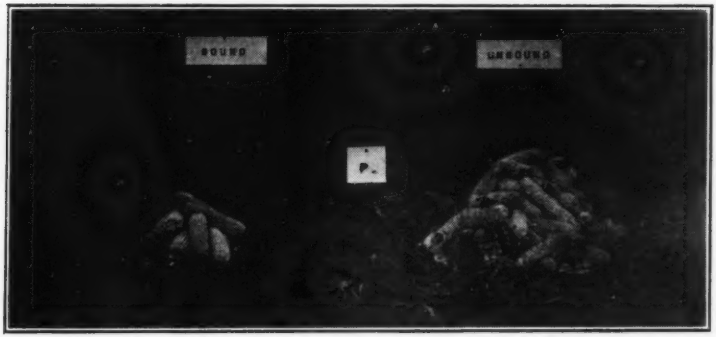
(*Turn to page 53*)

Corn grown in a rotation with fertilizer applications as above. Average annual yield for 16 years—76.5 bu. per acre, 89.1 per cent of which was sound. (Del. Exp. Sta.)

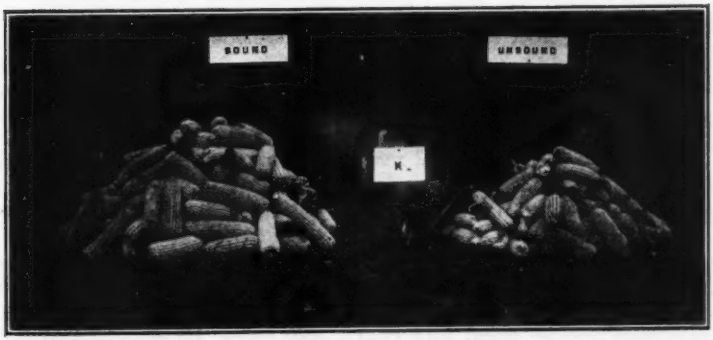
Effect of Fertilizers upon Quality of Corn. Corn grown without fertilizer was 39 per cent unsound



Corn grown with nitrate of soda was 35 per cent unsound.



Corn grown with acid phosphate was 36 per cent unsound.



Corn grown with muriate of potash was 27 per cent unsound.

Above results are averages for 16 years. Photographs are from 1924 harvest. (Del. Exp. Sta.)

Orchard Grass in Missouri

By C. A. Helm

Assoc. Prof. of Field Crops, Missouri College of Agriculture

GREENE county and her immediate neighbors comprise the orchard grass center of Missouri and with the rapid progress in acreage promises to over-shadow all other sections in hay, pasture and seed production in one of the most valuable of farm grasses. It is necessary only to travel through this section to be impressed with the value placed on this crop. Other tame grasses are prominent through their absence.

The reason for the popularity of this grass is not through chance. Its values are sound, definite, and profitable. Probably no crop including corn, oats, wheat, and soybeans, can guarantee, year after year, an equal profit.

Orchard grass is a three-in-one crop, or if red clover is sown with it, the combination becomes four-in-one. A seed crop, a hay crop, and abundant fall pasture are realized in one year. If red clover is used in connection, then an orchard grass seed crop, followed immediately with a combined hay crop of orchard grass and red clover, later in the season a red clover seed crop, followed by fall and winter pasture, may in most years be obtained from the same crop combination and in the one growing season.

Crop rotation is accepted generally as the basis of soil fertility. In the orchard grass section farmers need not be urged into crop rotation because the most returns from orchard grass are obtained only through rotation systems.

The basis of a cropping system is the sod crops in the rotation. Under most farming types a rotation with sod means an extensive live stock system which immediately bars most tenants and owners with limited capital or ability in live stock management. The growing of orchard grass does not necessarily require the handling of live stock extensively.

Orchard grass makes its best returns through one, sometimes two, and rarely more than three, seasons. Experience is all that is needed to induce the farm operator to plow up and resow the orchard grass acreage at regular intervals.

CORN is not only the most logical, but is usually the most profitable crop to follow orchard grass, Stands of orchard grass are best obtained with wheat or as a second choice, with oats. On most general farms wheat does not follow immediately after corn in a satisfactory way.

The natural result is the rotation: corn-oats-wheat-orchard grass (one to three years). With such a rotation in use then the practical soil treatments lime, phosphate, and manure, used separately or collectively as required, are in position to give large returns.

Red clover sown with the orchard grass does not, in the least, lower the returns of orchard grass seed yield. Its presence materially increases the meadow and pasture returns.

(*Turn to page 56*)

Hot-water treating of wheat seed. Mr. Altaffer is shown on the extreme left with his hands on the bag.

Improving Seed

By G. W. Patteson
Extension Agronomist, Virginia Agricultural College

A FEW years ago the State Agricultural College, Blacksburg, Va., produced a bearded selection of wheat from Fulcaster, known as V. P. I. No. 131, which far outyielded the seed from which it was selected, as well as other varieties and strains of bearded wheat in general use in Virginia. This selection found immediate favor with the farmers of the state and has become a widely used variety.

As is natural, however, since this strain has been in the hands of farmers it has in many instances become mixed, diseased, and otherwise lowered in its ability to produce large yields of good quality wheat.

Effort must be made to keep up the quality of good wheat seed or any other kind of seed. If this is not done it will gradually go down in quality until it is no better than the average.

W. A. Altaffer, Mt. Sidney, Augusta county, Virginia, has been growing V. P. I. 131 wheat for several years and likes it. Last year he averaged 35 bushels per acre with it. In June, 1925, though, just before he harvested that year's crop, the Agronomy Department at the State Agricultural College assisted him in making a head selection from his growing crop. He threshed this out by hand and found he had enough to seed one-sixth of an acre. This was seeded

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Missouri

By A. A. *Jeffrey*
Agricultural Editor, University of Missouri

¶ *The eleventh state experiment station to be visited on our tour.*

THE history of the Missouri Agricultural Experiment Station dates from a period when Missouri occupied a position of outstanding leadership in the agriculture of the Nation. It was established almost immediately after the passage of the Hatch Act by Congress, signalizing the victory of Col. William H. Hatch, Congressman from Missouri.

The victory was won over the opposition against which Congressman Hatch had battled tirelessly for half a dozen years in his far-seeing ambition to provide for the establishment of an agricultural experiment station in every state of the Union. It was this same period that gave to the United States its first Secretary of Agriculture as a member of the President's cabinet. Norman J. Colman of St. Louis, appointed by President Cleveland to this post, had already contributed a notable service to American agriculture in his advocacy of the Hatch Act through the editorial columns of Colman's *Rural World*.

Under these significant auspices the Missouri Experiment Station was established on January 31, 1888, by the board of curators of the University of Missouri. Dr. Paul Schweitzer, a chemist became the first director. Six months later the board of curators, evidently desiring to tie the new institution more closely to the university, reorganized the experiment station, making it a department of the College of Agriculture of the university and making the dean of the College of Agriculture also director of the station. By this reorganization, J. W. Sanborn, then dean of the college, became also director of the station.

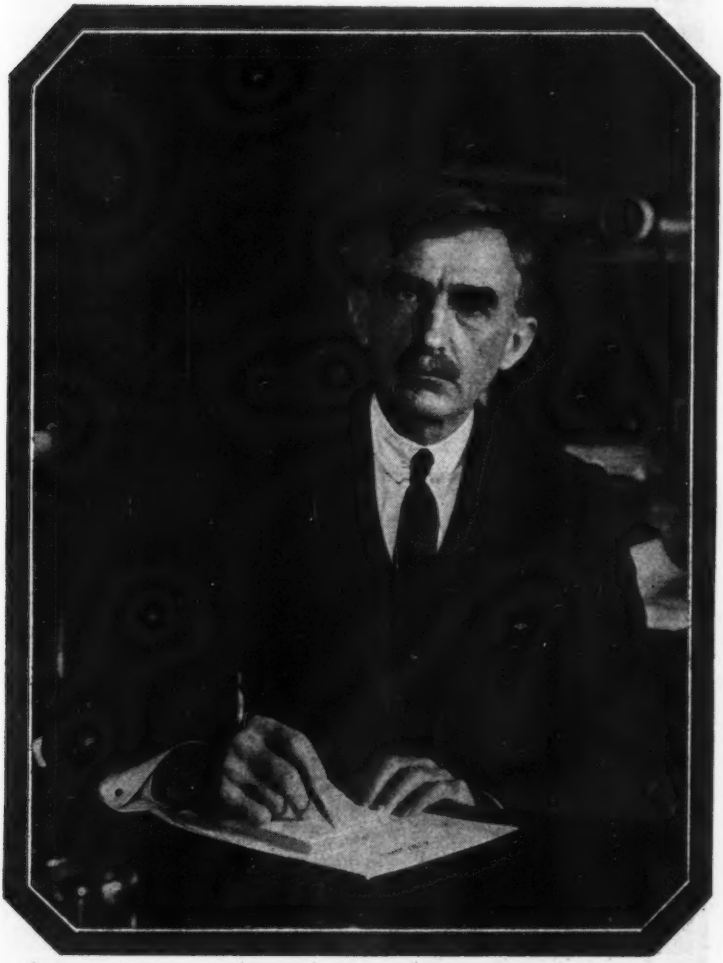
The plan established in the reorganization, July 6, 1888, has continued in effect till the present time, and the progress of the experiment station in rendering an ever increasing service to the state has been very satisfactory. There have been few changes in the directorship; for in 38 years this important position has been occupied by only five men, as follow:

Paul Schweitzer.....1888
Edward D. Porter.....1890-1894
P. Schweitzer (Acting) 1894-1905
Henry J. Waters.....1895-1909
J. W. Sanborn.....1888-1890
F. B. Mumford.....1909-

THE present director, F. B. Mumford, is now rounding out his seventeenth year as dean and director and is still a comparatively young man, though he has been identified with the station since 1895. In that year he came to the

(*Turn to page* 48)

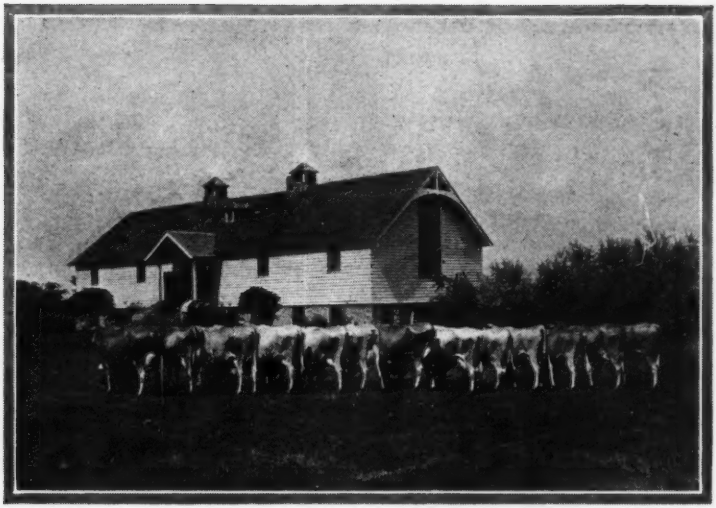
Better Crops' ART GALLERY of the month



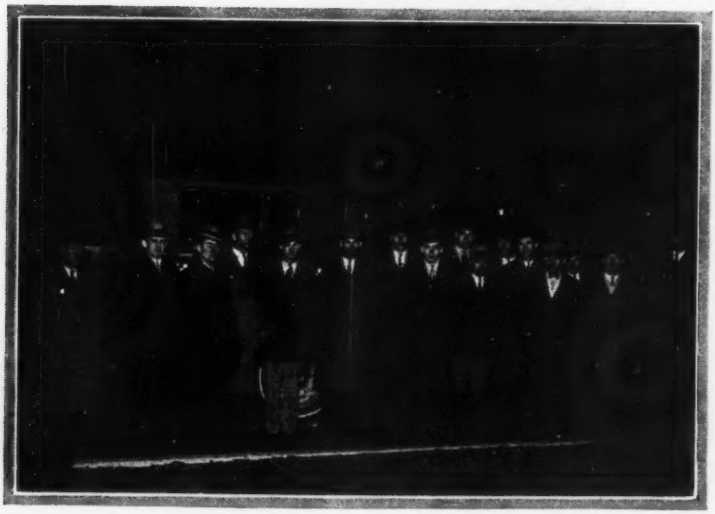
FREDERICK BLACKMAR MUMFORD
Director of the Missouri Agricultural Experiment Station

This year's State Corn Show held at the Missouri College of Agriculture during January was the twenty-fourth annual occurrence of this event—a great influence in introducing and standardizing varieties.

The main building, Missouri College of Agriculture. In its entire history the college has given systematic instruction in agriculture to 9,304 students.

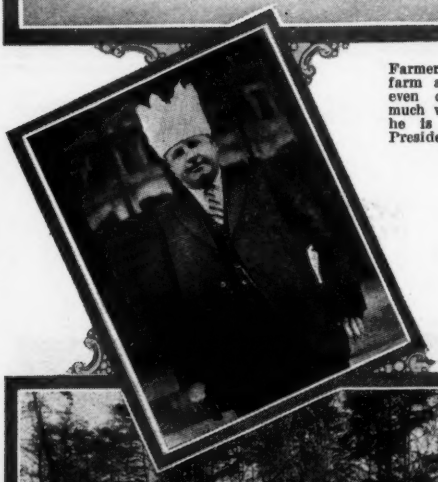


Thirteen daughters of Sultana's Virginia Lad, one of the Jersey herd sires, Missouri College of Agriculture. This great bull has 25 Register of Merit daughters averaging 579 lbs. of butter fat on yearly test.



Students of the Missouri College of Agriculture starting before daylight on a motor bus trip to attend a series of purebred beef cattle sale.

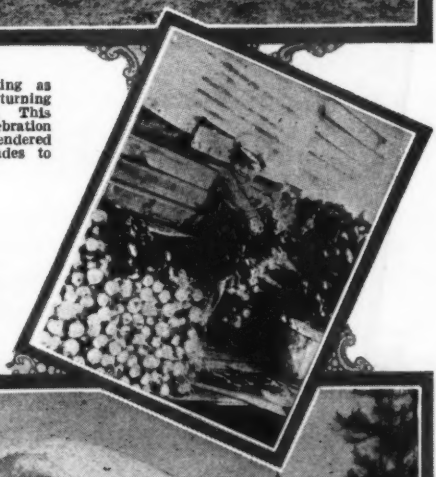
Farmer Caddy, in charge of the Coolidge farm at Plymouth, Vt., demonstrates that even during the winter months there is much work to be done on the farm. Here he is shown getting ready to make the President's maple syrup.



George T. Swearingen of Trenton, S. C., awarded a prize of $1,000 for having grown more cotton (10.92 bales on five acres) than any other planter in the state.

Dr. E. W. Nelson, well known for his studies of wild life, who is retiring as chief of the Biological Survey, United States Department of Agriculture, at the age of 71.

Seminole Indians in Florida planting as they did 200 years ago—the men turning the soil, the women sowing the seed. This was one feature of the recent celebration at which the Indians officially surrendered their tribal heritage of the Everglades to the white men.



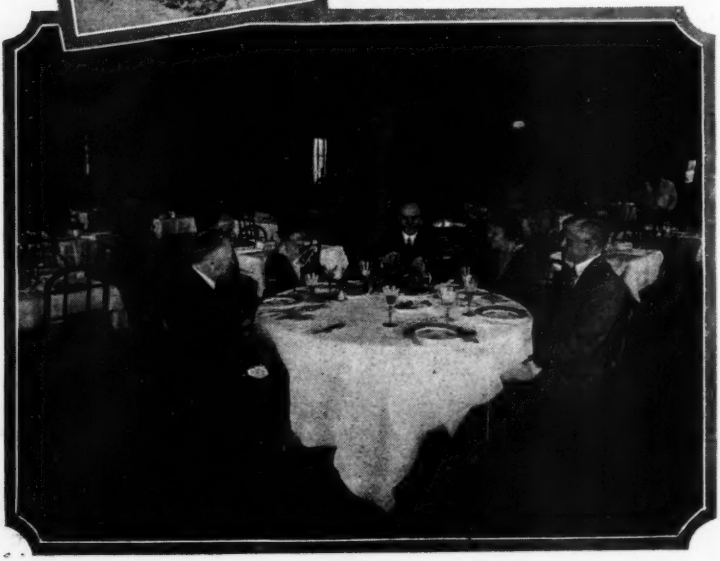
To Master Dean Sickle, 7 years old, of Florida goes the credit of harvesting the first crop of turnips in the U. S. for 1927. He cultivated the crop almost entirely by himself.

Paul G. Redington of the Forest Service, United States Department of Agriculture, who in May will become chief of the Biological Survey, United States Department of Agriculture.

There would be no crop surplus if there were more Nick Russos in the world. This Baltimore youth was crowned a champion eater when he devoured 52 tangerines, a loaf of bread, a can of tuna fish, a box and a half of crackers, 3 cakes, 3 sodas, a 40-cent peach pie, and 5 oranges.

A volunteer worker and some of his victims in California's war against the thousands upon thousands of mice that have been wrecking havoc in grain fields.

Secretary Jardine enjoying a roast of prize beef produced by Eugene Naffziger, 4-H Club member of Deercreek, Ill. At the Secretary's right are: Dr. Louise Stanley, G. E. Farrel and C. B. Smith—left: Miss Mary Lindsay and C. W. Warburton.



The Editors Talk

No man ever learned farming except by farming; and no man ever learned the whole of any one particular phase of farming in a day or a week or a month or a year or a lifetime.—
Uncle Henry's Sayings

THE greatest war against insects ever undertaken is now being waged in an effort to save the nation's most valuable crop from the attacks of what is considered the worst foreign invader in years. The European corn borer is here and unless something is done to repel it or to prevent injury from its attacks, King Corn will no longer hold the honor seat in American agriculture.

WAR

That this enemy is a serious one is shown by the manner in which Congress has received it. Only a few weeks ago a bill was introduced appropriating $10,000,000 for immediate use in fighting this devastating insect.

How this pest reached this continent and when has finally been solved by our scientists. Its movements from Italy and Hungary by way of a shipment of broom corn which arrived in Boston in 1910 have been traced. The first points of infection around Boston, Buffalo, Albany and in southwestern Ontario where this shipment found its destination, convincingly serve to identify the source of this insect.

That conditions here favor spread of the borer is shown by its rapid spread. Today it is a great menace, playing havoc in vast areas in the New England States, New York, Pennsylvania, Ohio, Indiana, and parts of Illinois and Michigan.

This insect has a peculiar fondness for corn, but by no means is its damage confined to this crop. Almost all field crops and a large number of flower plants are attacked. The few crops that are least affected are in general most legume crops, particularly clovers and alfalfa, sugar beets, tobacco, and small grains.

To avoid most serious damage, farmers should plan a combat campaign. Methods successfully employed are: selection of crops immune to the borer, rotation of crops including legumes, clean cultivation, and fertilization to produce strong vigorous plant growth. Large healthy plants are least injured by this insect.

Obviously ravages of the borer will greatly reduce crop acreage and at the same time increase the cost of production. In order to maintain normal production, therefore, it is necessary that acre yields be increased and cost of production lowered.

If the borer is not to become the greatest menace of the age, it will be only because science has proven itself the master of the situation. It is imperative that farmers employ every means at their disposal to repel this enemy.

To all interested in the success of American agriculture our slogan is:

United we stand, divided we fall—On with the war against the European Borer.

▼

THE WIFE'S PROBLEM

SHALL we buy a radio on the instalment plan or not? Dr. Wilbur C. Plummer has studied this question for the Academy of Political and Social Science. His findings were discussed recently in the "New York Times." It is very evident that good things can be said about instalment buying—also bad things.

Instalment buying has not tended to raise the general level of prices. It has not injured national savings. Forethought being required to provide for such payments, instalment buying acts as a discipline. It raises the standard of living and things cost less because such buying encourages mass production and cuts down production costs. It is a good thing.

On the other hand, among people with small incomes, instalment buying discourages thrift. These people are exposed to the dangers of high pressure salesmen. The next business depression will be hastened by instalment buying, because over-production is created. The depression will last longer, because it will take time to consume the existing goods produced. Credit now ranges as high as 80 per cent with rates common between 11 and 40 per

cent. Instalment buying is a bad thing.

Well, the question is—shall we buy the radio at $15 a month or not? If you ask Dr. Plummer he will tell you that instalment buying is here to stay.

▲

DEBATE THE QUESTION

WHY not ask that industrious and hard-working body of men—our college debating team—to settle the important question of instalment buying? Let them quit fighting over heredity and environment and get right down to the question—Proposed: "That instalment buying is bad for the country—that every purchase should be paid for in full with cash."

The only defect in this idea is that should the affirmative win, the team might accumulate for itself much embarrassment in living up to its decisions. On second thought, we are doubtful if any body of "regular students" would be sufficiently enthusiastic about the affirmative to run any danger of winning.

As the "Times" points out, such buying is on the "Economic Frontier." This means we each have to stand on our own feet and do our own pioneer doubting and deciding. The important thing is to be sure to do some of both. It will pay.

▲

THE METRIC SYSTEM

AMERICA today is being urged to adopt the metric system. The question is before Congress. Nation-wide interest is being displayed in the adoption of the metric system and although the same proposal previously has been before Congress, never have conditions been so favorable for its adoption.

Our present system of weights and measures, the "English System," is confusing.

Think of an intelligent nation tolerating such an antiquated system as ours with its four different sizes of pints, quarts and gallons, three of gills, two or three kinds of miles, two different sizes of hundredweight, four different tons, three kinds of ounces, drams and pounds, and an untold number of different sizes of bushels. An awful jumble.

It is significant to note that most of the civilized nations of the world have adopted the metric system with the exception of

the United States and Great Britain. Even more significant is the fact that at the First Pan-American Standardization Conference held at Lima, Peru, the United States delegation concurred in the resolution to adopt this system, and later at a similar conference in Washington, the Americas agreed to adopt the system.

Almost all parties to this agreement have taken steps to put this system into effect. What have we done? Where are our much talked of principles of international honor? If for no other reason than a sense of honor—the United States should at once take definite action.

But there are other reasons why we should adopt this system. World trade relationships have a vital bearing on standards for weights and measures: science, medicine, labor, finance, engineering, education, and agriculture have endorsed it. In fact, it is obvious that all elements of our population are favorable to it. Our currency system is already on the decimal basis.

The opponents of the metric system are few—estimated by authorities at less than 1 per cent—sad indeed does it appear—for so important a thing as "standardized weight and measure" to be defeated by minority interests. They have prevented its adoption in the past, but it is hoped the day of minority rule has passed—for all time.

Let the United States assume her obligation in the advance of civilization and join the Metrical Order.

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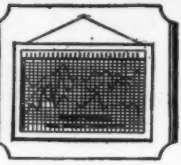
ONE ENEMY LESS

WE can now pick up the telephone in our office and talk to London. The inventors are to be congratulated. The effect of this invention in developing the world's social relationships will be tremendous.

While there was a rush during the first day or two, the number of talkers has fallen off somewhat since. This may be because people can think of several things to do with $75 which gives more pleasure and takes longer than three minutes in the spending. Free talking over a distance of three yards of space with no time limit still is preferred to talking over three thousand miles of space against the clock.

It costs money to eliminate distance. Distance is the world's arch enemy to social and rural progress. It will be eliminated and in the long run everybody will cheerfully pay their share of the bill.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Plastering Psylla

The way to make an insect behave is to put him in a plaster of Paris cast. At least that is an effective method with the pear psylla, as determined by the New York State Agricultural Experiment Station. In the insect's early stages its body is soft and moist, and plaster of Paris dust will cling to it and form a suffocating case. In this stage the dust mixture used is made up of four parts of freshly hydrated lime and one part of high grade plaster of Paris. The mixture is harmless to the foliage and costs only 3 cents a pound, enough for dusting an average tree. During later stages of the insect it is necessary to add a pint of nicotine sulfate to 50 pounds of the dust. To control fungous diseases at the same time, 10 pounds of sulfur or 2 pounds of copper dust may replace similar quantities of lime in 50 pounds of dust. To get the chewing insects 5 pounds of lead arsenate may be added to 50 pounds, replacing lime. It is suggested the method may be effective against other orchard pests.

New Ration Speeds Chicks

The poultry farm at Rutgers University, New Jersey, has developed a poultry ration which has made it possible to grow White Leghorns to a weight of 1¼ pounds when 8 weeks old and keep up steady gains until they mature at four pounds. The college poultrymen had in mind the requirements of birds raised in confinement, and the prevention of coccidiosis, round worms, black head, and tape worms. The ration is made up of 20 pounds of wheat bran, 20 pounds of Red Dog flour, 20 pounds of yellow corn meal (whole corn ground), 20 of ground rolled oats, 10 of meat scrap (50 per cent), 5 of dried milk, 2 of oyster shell meal, 1 of salt, and 1 quart of cod liver oil. The directions prescribed call for sour skimmilk or commercial condensed skim-milk or buttermilk for the first three days: from the third day to a week, mash in pens twice daily all the chicks will eat in 20 minutes and scratch feed three times daily all they will eat in 20 minutes. From one week to twenty weeks—fresh mash in the hopper daily and plenty of space for the chicks to get to it; scratch feed three times daily; tender green feed fed sparingly at first and later all that will be eaten in 15 minutes. Infertile eggs from the incubator boiled are recommended as a delicacy.

Pasteurization Favored

Recently a publication devoted to certified milk quoted Dr. E. V. McCollum, well known nutrition authority of Johns Hopkins University, as saying that requiring pasteurization of all milk sold in Baltimore had caused rickets among children to increase 100 per cent. "This statement is entirely

fallacious," says this scientist. "Nothing is better established than the fact that there is no relation between the use of pasteurized milk and the occurrence of rickets in children. I am unqualifiedly in favor of pasteurization and would recommend it even for certified milk."

Milking Machine

Even the owner of a 10 or 12-cow dairy farm can afford to invest in a milking machine say the farm mechanics specialists at the University of Illinois. Just as an example they tell of one farm where the hired man used to come in from the fields an hour early to help with the milking of the 10 cows. Since an electrically-operated two-unit milker was put in, the farmer does all the milking himself in about half the time. About 15 minutes a day is needed to keep the machine clean.

100 Bushels Pays

At the recent Ohio Farmers' Week the question came up as to whether the much sought 100-bushel corn crop is worth the cost. The figures from reports of contestants in the Ohio 10-acre corn contests for the past six years were brought in to answer the skeptics. The 324 detailed reports showed that those producing round 60 bushels to the acre up to harvest time expended 46 cents a bushel; and that those who got about 100 bushels to the acre spent only 26 cents a bushel in growing the crop up to harvest time.

Outside Treatment for Outside Parasites

The simplicity of treating an animal for lice by giving it a drink has led farmers to hope for such a treatment so fervently that fakers have taken unfair advantage by claiming to have the magic potion. The Bureau of Animal Industry long ago made tests by feeding sulfur to cattle but noticed no effect on external parasites. Similar treatment administered to sheep had no effect on scab. Manufacturers have claimed to have chemicals that given internally would ward off flies; others that their product if fed to chickens would keep off lice and mites. Government tests have not found one of these that works. The conclusion is: External remedies for external parasites, and internal remedies for internal parasites.

TB-Free Counties Increase

Nineteen more counties in eleven states have been listed as modified-accredited areas by the U. S. Department of Agriculture as a result of tests showing less than one-half of one per cent of tuberculosis infection. There are now 285 such counties in the entire country. The new ones are: Idaho—Franklin and Lincoln; Illinois—Crawford; Indiana—Daviess, DeKalb, Union and Vermilion; Iowa—Hamilton; Maine—Somerset; Nebraska—Lancaster and Phelps; North Carolina—Pasquotank; North Dakota—Walsh; Pennsylvania—Indiana; South Carolina—Anderson and Oconee; Kentucky—Carroll, Grant and Oldham. Greene and Wayne Counties, North Carolina, were re-accredited, the first 3-year period having expired.

New Sausage Skins

Sausages in a new dress, really made of cloth, are a prediction for the near future. Then we will have uniform weiners, bologna, summer sausages and everything. The new casing is to be made of seamless cellulose film made into tubes of any size desired. The South is probably pleased to know that this cellulose is made from high grade cotton linters.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

Fertilizers *for* Tropical Plants

An abstract from "Fertiliser Requirements of Tropical Plants and Soils" by Dr. A. Jacob and V. Coyle, M. Sc.

ARTIFICIAL fertilisers are already widely used by European planters in the cultivation of tropical crops. One result of the advances, which have been made by farmers of temperate climates, in the use of artificial fertilisers is, that tropical agriculturists have also carried out experiments with fertilisers and the success of these tests has demonstrated to planters the practicability of increasing their crops by the rational use of artificials.

The lack of farmyard manure is especially felt in the tropics, where cattle are not kept in the same manner as in temperate regions, and the need of substitutes becomes every year more urgent. When used as substitutes for dung, artificial fertilisers have the advantage that they are required only in relatively small quantities because of their high degree of concentration. This is a very real advantage in those places where problems of transport and of labour are acute.

Although artificial fertilisers have been used in the tropics for years, it is no matter for surprise that the tropical planter is not yet so advanced in his knowledge of systematic manuring as are the farmers of temperate zones. The initial stage of one-sided manuring, a step already passed through by the old established agriculture of temperate countries, is only now being made in many tropical lands where planters are still content to use nitrogenous or phosphatic fertilisers alone and where they are quite satisfied if by such one-sided manuring they obtain some increase in yield, whereas they should endeavour to increase their profits still further by giving a well-balanced, complete dressing containing all the necessary plant foods.

Artificial manures, if properly used, do not exhaust the soil, as does one-sided manuring, but maintain and balance its natural fertility, by returning to the soil all those plant foods, which are re-

moved from the soil in great quantities by the crop plants.

The most important fertiliser constituents are nitrogen, phosphoric acid, potash, and, to a certain extent, lime.

That the practice of complete manuring in tropical agriculture is still capable of very wide extension, is shown by the relatively low consumption of the potash fertilisers. Only in a few countries of advanced agricultural knowledge is potash employed, and even in these countries it is not used sufficiently to produce the maximum profit.

The reason for this neglect of potash must be sought in the fact that the effect of potash on the life of the plant is principally physiological, and in consequence is often not very apparent to the eye. Potash not only augments the yield, but it also has a very favourable influence on the general growth and health of the plant, while frequently it improves the quality of the crop.

As it is very difficult to form a correct opinion of all these influences, especially where one has to base one's judgment on an experiment of only short duration, it is evident that the advantages of using potash together with nitrogen and phosphates have frequently been overlooked or have not been fully realized. Even in European agriculture, it took a very long time before potash was elevated to its proper place beside nitrogen and phosphoric acid, for the experiments carried on during the first few years gave deceptive results with regard to the use of potash, and only later was potash proved to be one of the most important aids to the production of maximum crops and to afford a solution of the "minimum cost of production" problem.

The difficulties attending the work of planters in the tropics render economy essential. In order to practice true economy, planters should first recognize the vital importance of complete manuring and should then exert themselves to discover how each plant food constituent can best be made to serve their interests. To achieve this end, it is imperative that they discover for themselves, by experiment on their own soils, the part played by each of the different plant foods in encouraging the growth of the crops.

PLANT food may be defined as anything that enters into the plant and serves to build up its tissues. A great many elements come under this heading. There are only four, however, which need be considered by the practical planter, as the others are all present in abundance, in all cultivated soils. The four elements likely to be in short supply are nitrogen, phosphorus, potassium and calcium.

Nitrogen is a constituent of all vegetable matter. The most important nitrogenous substances in the plant are the proteids and the amides. The nitrogen of the air is useless to the plant, which is unable to avail itself of this element in the free state, but must find it in a combined form, generally as nitrates. Even if combined nitrogen be present in the soil in other forms, e.g. as organic nitrogen, or as ammonia, these forms, by the action of so-called nitrifying bacteria, are usually first transformed to nitrates, before they are assimilated by the plant.

Nitrogen is the element, which forces the plant, producing a luxuriant growth of the leaves to which it imparts a dark green colour.

Phosphorus, like nitrogen, is of importance in the formation of proteins, of which it is an essential constituent. It is taken up by the plant only as phosphates in

easily soluble form. A good supply of such phosphates is essential for seed and fruit production in all flowering plants. Phosphoric acid also is said generally to hasten ripening.

With regard to the function of potash in plants, empirical research has led to the conclusion that potash plays an essential part in the formation of carbohydrates. This theory is strongly supported by the fact that plants with a high percentage of sugar and starch, especially sugar beets and potatoes, respond readily to dressings of potash fertiliser. Furthermore, it has been observed, that as a result of potash manuring the sugar content in all fruit, including grapes, rises considerably.

The above theory has lately been confirmed experimentally, by Professor Stoklasa of Prague, who showed that potash was an indispensable catalyst in the formation of carbohydrates in the plant, a process which takes place through the aid of chlorophyll under the action of sunlight. Professor Stoklasa first carried out an anatomical investigation upon the distribution of potash in the plant which showed that potash was always present in cells containing chlorophyll. The greatest quantities of potash were always found in those parts of the plant which were most exposed to the light of the sun, and where the formation of organic compounds took place most actively. This implied that potash played a specially important part in photosynthesis, and by careful and original experimental work, he proved this to be the case.

In his experiments he succeeded, by the use of ultra-violet rays, and without the plant, in making sugar synthetically from water and carbon dioxide, the one indispensable condition being the presence of potash. The special part played by potash in this reaction is attributed by Professor Stoklasa to its radio-activity, a fact which was discovered by Campbell in 1906. This radio-activity of potash is again indicated by the fact that Stoklasa later succeeded in effecting the same reaction in the absence of potash but only when the apparatus was exposed to radio-active rays.

The researches of Professor Stoklasa have proved that potash is of fundamental importance to the vital processes of plant life, and therefore that considerable supplies of potash must be available to all crop plants.

Lime has a double function in agriculture. Firstly, it is an essential plant food, which must be present in sufficient quantity. Secondly, lime is even more important in ameliorating the physical structure of the soil and neutralizing soil acidity.

The quantities of the principal fertiliser constituents required for effective crop production are given in the following table, which sets out the quantities of plant food taken from an acre of land by average crops of the principal tropical cuture plants.

These quantities of the various fertiliser constituents must, of course, be at the disposal of the crops in an easily available form, otherwise full yields are impossible.

* * *

Winning With Rabbits

(*From page 5*)

this fact, Charley Campbell's success is assured. Up until the past year his poultry have been a losing proposition. In 1926, however, they paid well, and with the income from his rabbits he is winning a very up-hill battle.

Such grit strengthens confidence in men to overcome obstacles.

Testing for Diplodia Rot

(*From page* 16)

least eight per cent more stalks than in the plot planted to the diseased seed. The stand in the 'farmer's' corn was just about an average between these two. In the fall when we harvested the seed, the healthy corn plots made a yield of 71 bushels per acre, the diseased, 63, or eight bushels less per acre.

Mikkleson sat quietly absorbing the information. "Guess I'll have to treat my seed for disease, if that's the case," he ventured at length, "they've got dope advertised for this purpose."

He would not let himself admit that there might be some good done by testing. That he might be mistaken, never entered his head. He was of the hard-shell, wise type who seem to delight in intrenching themselves in their own argument.

THE county agent reached over to his desk. "Here," he said, "is a report of an experiment carried on this year in Chickasaw county on the Drewelow farm. Nine different lots were treated for dry rot. But none of the treatments used was found to be effective.

"A part of the plot was planned to demonstrate the effect of diseased seed on the succeeding corn crop, and to demonstrate the saving that could be effected by discarding all the diseased ears that were detected by the modified rag doll germination test. (A strip of heavy manila paper—butcher's paper has been found to be very practical because of the glazed, waxy surface—placed underneath the muslin strip. The impervious paper prevents the spread of mold from one ear to another.) These results indicate that there could be a saving—in other words an increase—of 425 bushels per farm by testing out the ears in which dry rot, or diplodia mold, showed up.

"Disease-free seed yielded at the rate of 78.5 bushels per acre; diseased seed, 64.7, and 'farmer's' seed, 70 bushels per acre. Disease-free corn outyielded the 'farmer's' corn by 8.5 bushels per acre, and diseased corn by 15.8 bushels per acre. Experiments conducted by the extension department throughout the state show similar results.

"We do not know exactly what we may have to do to check the ravages of the European corn stalk borer, but we do know what we can do to stop the spread of dry rot in corn. Carefully testing the corn is the most important. The kernels which show any signs of mold should be discarded. We can, of course, avoid some of the moldy ears in selecting the seed. Since the spores live over the winter on diseased stalks, a system of crop rotation will help."

Mikkleson actually forgot himself. "How can you tell the mold in the test?" he blurted out.

"The mold will show up on the kernels," explained the agent. "Down stalks, broken shanks, and premature drying of the ear, are indications of dry rot. Many of the ears are badly molded, others only partially. On the badly infected ears the husks will be tightly matted against the ear. In many cases the mold may be present and be invisible until the test shows it up. Such ears, of course, may spread the disease.

"Diplodia mold spreads most rapidly and is most troublesome in wet seasons, and at temperatures ranging around 85 degrees. The mold may spread even after the corn is picked, especially if it is

(*Turn to page* 55)

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

About one-third of the fertilizer used in the United States is applied to the cotton crop. It is, therefore, highly important that experiments be conducted in order to obtain the most profitable results from the use of the millions of dollars spent on fertilizers for cotton. What are the effects of different analyses, how much fertilizer should be applied per acre, and what are the effects of the different sources of nitrogen upon yield and maturity? These questions have been carefully studied as a result of experimental work by C. B. Williams, S. K. Jackson, and H. B. Mann of the Department of Agronomy, North Carolina Experiment Station. The results of this work are published in Bul. 250, Dec., 1926.

Analyses of commercial fertilizers sold on the open market are published by the different experiment stations. The high analysis movement is gaining ground and the best way to keep in touch with fertilizer analyses on the market is to study these reports.

Five such bulletins giving the analyses and reports on inspection of commercial fertilizers for New Jersey, Pennsylvania, Connecticut, Massachusetts and New York are listed below:

"Analyses of Commercial Fertilizers, Fertilizer Supplies and Home Mixtures for 1926," New Jersey Agricultural Experiment Station, New Brunswick, N. J., Bul. 440, Oct., 1926, Charles S. Cathcart.

"Fertilizer Report 1925," Pa. D. of A., Harrisburg, Pa., Vol. 9. No. 7, Apr. 1, 1926, James W. Kellogg.

"Report of Inspection of Commercial Fertilizers, 1926," Conn. Agricultural Experiment Station, New Haven, Conn., Bul. 282, Nov., 1926, E. M. Bailey.

"Inspection of Commercial Fertilizers," Massachusetts Agricultural Experiment Station, Amherst, Mass., Bul. 37, Nov., 1926, H. D. Haskins, L. S. Walker, and M. W. Goodwin.

"Composition and Prices of Commercial Fertilizers in New York in 1926," New York State Agricultural Experiment Station, Geneva, N. Y., Bul. 539, Nov., 1926, L. L. Van Slyke.

Soils

The First International Congress of Soil Science will convene on June 13 of this year in Washington, D. C.

A preliminary announcement of the program of this meeting has just been issued. Any one wishing to secure a copy of this program should write Dr. A. G. McCall, Executive Secretary, Room 112, U. S. Department of Agriculture, Washington, D. C.

The Executive Committee who have charge of arrangements for this meeting of soil scientists deserve vastly more credit for their efforts than similar committees ordinarily receive.

We, therefore, take great pleasure in publicly commending the committee, and particularly its Executive Secretary for their unselfish devotion to the task committed to their charge.

"Factors and Problems in the Selection of Peat Lands for Different Uses." U. S. D. A., Dept. Bul. 1419, Oct., 1926, Alfred P. Dachnowski.

"Wisconsin Studies Upon the Relation of Soil Temperature to Plant Disease," Agricultural Experiment Station, Uni-

versity of Wisconsin, Madison, Wis., Bul. 71, Nov., 1926, L. R. Jones, James Johnson, and James G. Dickson.

"Soil Survey of Adams County," Madison, Wis., Bul. 61D, Soil Series 42.

"Soil Survey of Jackson County," Madison, Wis. Bul. 54B, Soil Series 24.

"Soil Survey of Racine and Kenosha Counties, Madison, Wis., Bul. 56B, Soil Series 29.

"Soil Survey of Walworth County," Madison, Wis., Bul. 56C, Soil Series 30.

"Soil Survey of Washington and Ozaukee Counties," Madison, Wis., Bul. 59C, Soil Series 33.

Crops

"American Potato Journal," Washington, D. C., Vol. IV, No. 1, Jan., 1927, R. J. Haskell.

"Returns from the Arkansas Radish Crop in 1926," Agricultural Experiment Station, University of Arkansas, Fayetteville, Ark., Bul. 214, Nov., 1926, C. O. Brannen and J. A. Dickey.

"Planting and Thinning Distances for Deciduous Fruit Trees," Agricultural Experiment Station, University of California, Berkeley, Cal., Bul. 414, Nov., 1926, F. W. Allen.

"Palms of Florida," Agricultural Experiment Station, University of Florida, Gainesville, Fla., Bul. 184, Oct., 1926, Harold Mowry.

"Corn and Hogs vs. Cotton for Profit," N. C. Agricultural Extension Service, Raleigh, N. C., Ext. Folder 26, Feb., 1927, W. W. Shay.

"The Pecan in Oklahoma," Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Okla., Experiment Sta. Cir. 59, Apr., 1926, D. V. Shuhart.

"The Quality of Oklahoma Flour," Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Okla., Cir. 63, June, 1926, A. Daane.

"A Suggested System for Oklahoma Cotton Farms," Oklahoma A. & M. College Extension Division, Oklahoma, Cir. 233, Gen. Ser. 72, D. P. Trent.

"Speakers Summary for Oklahoma Cotton Acreage Reduction Campaign," Oklahoma, A. & M. College Extension Service, Oklahoma, Cir. 235, Gen. Ser. 74.

"Improving Stands of Grain Sorghums by Seed Treatments," Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Okla., Sta. Bul. 159, Apr., 1926, H. H. Finnell.

"Red Clover Experiments," Virginia Agricultural Experiment Station, Virginia Polytechnic Institute, Blacksburg, Va., Bul. 252, Dec., 1926, T. K. Wolfe and M. S. Kipps.

"Making Better Farms and Homes," Extension Service, State College of Washington, Pullman, Wash., No. 140, Dec., 1926.

"Root Nodule Bacteria of Leguminosae," Agricultural Experiment Station, University of Wisconsin, Madison, Wis., Research Bul. 72, Nov., 1926, E. B. Fred, A. L. Whiting, and E. G. Hastings.

"Thirty-Eighth Annual Report," Agricultural Experiment Station, University of Arkansas, Fayetteville, Ark., Bul. 215, Nov., 1926, Dan T. Gray.

"Annual Report of the Agricultural Experiment Stations of Louisiana State University and Agricultural and Mechanical College for 1925," Louisiana State University and A. and M. College, Baton Rouge, La.

"Report of the Director," Utah Agricultural Experiment Station, Logan, Utah, Bul. 198, Dec., 1926.

Economics

If some of the leading authorities of North Dakota have their way, a ship-load of freight will be able to go all the way from the North-Atlantic port to North Dakota without transshipment. It is estimated that this would materially benefit both North Dakota and the eastern industrial sections of the country. North Dakota is a part of the landlocked agricultural region that produces a surplus of a great number of commodities. On the other hand, the New England states, for instance, are dependent upon that part of their country for a large part of their food supply and raw materials. What the East and North Dakota both need, according to the North Dakota Tidewater Commission is cheaper transportation, and this would be available if the Great Lakes-St. Lawrence Deep Waterway were constructed. The results of the Commission's work are published in Bul. 204 of the North Dakota Agricultural Experiment Station.

Silo filling represents approximately 40 per cent of the total cost of silage. The average cost of filing silos is $2.06 a ton. Farmers who have small silos can hire an engine and cutter cheaper than they can be owned and operated. Other important points about the cost of filling silos are given in Bul. 386, Agricultural Experiment Station, Wisconsin. The authors are P. E. McNall and W. A. Hartman. The bulletin is worth reading by any one interested in silos.

Farming is a business. For many years, the business side was overlooked in our educational and research work, but in recent years

is coming more and more to the front. Three interesting bulletins along these lines have been recently published.

"What Type of Farming is the Most Profitable," Cir. 234, is published by the Oklahoma Agricultural College, Extension Service. "Safe Farming for 1927," Cir. 232, published by the same institution, is also very interesting and profitable.

North Carolina State College of Agriculture, has published Extension Circular 163, "A Business Farming Program for North Carolina." The basis of this bulletin is diversification and reduction of the cotton acreage in 1927 by 30 per cent. It is, therefore, necessary for cotton farmers to substitute other profitable enterprises in connection with cotton production.

How can such a substitution be planned? The facts upon which such plan must be based are given in the bulletin. They include points of good farming, the all-year round garden; the farm poultry flock; the family cow; the family pork supply; the farm flock of sheep, and the safe cropping program. All are discussed in relation to diversifying cotton farm production in 1927. This is an important phase of southern agricultural progress.

Going from North Carolina across the country to California, we notice that L. J. Fletcher and C. D. Kinsman have published a very interesting bulletin, written to aid the farmers of California in the choice and successful operation of their field power. The purpose is also to impress upon manufacturers and dealers the need of supplying tractors of the proper design and type to meet the special requirements for farming in California. The bulletin is well illustrated throughout, is practical and complete, and should be in the hands of any farmer who is considering buying a tractor.

Other bulletins are:

"Farm Economics," Alabama Polytechnic Institute, Auburn, Ala., Vol. II, Nos. 3 and 4.

"Economic Aspects of Citrus-Fruit Growing in Polk county, Fla.," U.S.D.A., Dept. Bul. 1435, Carl R. Swinson and W. C. Funk.

"Farming in the Big Bend Country," Agricultural Experiment Station, Pullman, Wash., Bul. 135, Oct., 1926, W. J. Spillman.

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* * *

TOO CONVENTIONAL

It was dark in the movie house, but Mose felt a man's arm steal around the waist of his dusky sweetheart. "Calline," ordered Mose heatedly, "tell dat lowdown Niggah on de yutha side t' take his ahm fum yo' waist."

"You tell him yo'self. He's a puffeck strangeh to me.—*The Pathfinder.*

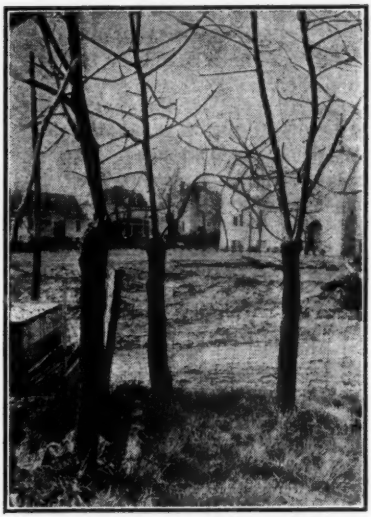
Missouri

(*From page 28*)

Missouri College of Agriculture when there were but three full-time professors on the teaching and investigational staff, and at a time which constituted the most critical period in the history of the institution. Because of a lack of progress and development up to this point there had developed in the state legislature a movement to separate the college from the university and to change its location. The ultimate failure of this movement in 1895 was marked by increased appropriations which made possible an enlarged faculty and more aggressive policies in the development of the experiment station. The growth of the institution from 1900 till the present has been especially rapid.

The last report of the Missouri Agricultural Experiment Station publishes the names of more than 70 individuals on its staff engaged in some form of research in agriculture and home economics. The same report publishes a brief description of the results of work being done in connection with 92 separate research projects. In the one year ending June 30, 1925, the station published 49 bulletins and circulars. These publications, if bound in one volume would make a book of 1,156 pages. The total number of pages of printed matter issued by the station during the year amounted to 8,621,800 pages.

It is not too much to say that modern agriculture would not be possible without the help of the agricultural experiment stations. The enemies of agriculture increase as the agriculture of a country grows older. Plant and animal diseases are very much more serious menaces to agriculture today than at any former time. The



On Missouri farms are millions of seedling black walnut trees. The Experiment Station has demonstrated that these trees can be top-worked with grafts from improved, thin-shelled varieties.

control measures and methods of prevention developed by the experiment stations are essential to modern agriculture.

Through the work of the experimental station, the Missouri College of Agriculture now has under constant observation and analysis 103 distinct lines of investigation. Some of these are new—seeking the solution of new problems as they arise—others are now in their fourth decade of constant study. One of this latter class is represented in Sanborn Field, a group of soil plots established in 1888 where the long-time effects of various systems of crop rotation, manuring, and application of fertilizers have been under minute study for 37 years.

The most important service rendered to the people of Missouri by any public institution is this help given them by their agricultural

experiment station in gaining a better understanding of their soil —its values and its limitations— and how they may get from it a better living without robbing their children of the greatest of all natural resources.

The Missouri Agricultural Experiment Station in cooperation with the U. S. Department of Agriculture is making a detailed survey of Missouri's soils, county by county, examining closely the soil and subsoil of every 10 acres in the areas covered. Thus far 55 of the 114 counties of the state have been thus surveyed, mapped and described in published reports giving information on the agricultural value and methods for handling each soil type. More than 185 distinct soil types have been identified, mapped and described.

Since 1905 the station has maintained 30 soil experiment fields for varying periods on the most important general soil types representing half the area of the state, and under strictly practical conditions has developed treatments that greatly increase the acre-yields of staple crops. Average increases of 10.72 bushels of corn, 8.7 bushels of wheat and approximately one ton of clover hay have been secured by treatments adapted to the various soils and so economically that the increased production is in all cases highly profitable.

THE Missouri Experiment Station annually saves Missouri farmers 20 to 30 per cent on a two-million dollar fertilizer bill. In an average year the farmers of Missouri purchase $1,800,000 worth of commercial fertilizer, and are protected in these purchases by an inspection service administered by the station. All fertilizers must be registered with the station by the manufacturers who give a complete guarantee of the amount of plant food contained therein. The station collected last year 558 samples of fertilizers from dealers, from the farmers' wagons, or from manufacturers' warehouses. These samples were analyzed and the results published. The last fertilizer bulletin published shows that Missouri farmers obtained on the average $1.02 more in plant food in each ton of fertilizer than was guaranteed by the fertilizer manufacturers.

YEARS of detective work have been required in the experiments conducted by the Missouri Station to get accurate and reliable information on the operations of the greatest thief in agricultural history—soil erosion. By actually catching, measuring and analyzing the run-off from a number of plots of soil under different crops and systems of cultivation—doing this the year around for six years—the station has established the fact that erosion carries away the top seven inches of soil from a field of less than 4 per cent slope in 56 years if cropped continuously with corn, in 150 years if in wheat, 437 years if kept under a rotation of crops, and 3,547 years if kept in sod.

The station in two years has secured the application of 102,794 tons of pulverized native limestone on soils that had become unproductive because of sourness. In carrying out this work of rebuilding sick soils the College of Agriculture tested the soils of 4,931 farms, introduced 109 limestone pulverizers, and established 1,266 limestone demonstrations.

On Missouri's most important general soil types representing half the state's area the Missouri Ex-

periment Station, by maintaining 30 soil experiment fields, has developed soil treatments that eliminate clover failures and their accompanying train of losses, waste of seed, erosion of soil, shortage of feed, and disturbance of crop rotation. The economy and efficiency of such treatments have been safeguarded through service supplied by the station in testing soils for acidity, and samples of limestone for their content of soil sweetening elements, calcium and magnesium.

To 53,000 adult farmers in 75 Missouri counties the Missouri College of Agriculture within the last three years has carried the message of "Clover and Prosperity"—a movement for the statewide adoption of systematic rotation of crops including some legume at least once in every four years as indicated by the findings of the Experiment Station. In most of these counties two all-day meetings were held, and to all these the college sent extension speakers and a truckload of materials to demonstrate the soil-building, stock-feeding, profit-making possibilities of legumes and rotation, and to fully explain the methods essential in each locality.

The Missouri Station through years of experiments with hundreds of varieties and strains of corn in all parts of the state has learned which are the best varieties for each section of Missouri. A difference in yield as great as 40 bushels an acre has been found among varieties grown on the same piece of land. The college has published in free bulletins and circulars descriptions of the best varieties for each region and the best ways to grow them. If this information were applied to Missouri's entire acreage of corn the yield from 7,000,000 acres could be increased from 5 to 10 per cent with no greater investment in land, equipment, or labor—only the use of the right seed in the right place.

SOUTHEAST Missouri is making better yields of cotton as a result of tests made by the experiment station to determine the most productive varieties. Among the varieties of cotton tested, yields differed as greatly as 150 pounds of lint to the acre. The present wide use of the highly productive Acala variety is the direct result of these tests and recommendations.

By maintaining experimental wheat fields in every section of the state the station has determined for every county in Missouri the date on which wheat can be seeded to escape infestation by the Hessian fly. In this work the institution has saved 40,000,000 bushels

The show winners in this picture, and some 500 similar boys' and girls' club calves of the three popular beef brands, were fed in 1925 according to the best information worked out by the Experiment Station.

of wheat at an expense not greater than one-tenth of a cent per bushel.

In 10 years the Missouri College of Agriculture has performed one of the wonders of modern science by turning a practically unknown plant into a 15,000,000-dollar crop which fits in a desirable crop rotation, brings high cash returns, supplies protein-rich forage and improves the soil. Ten years ago the experiment station was the chief grower of soybeans in Missouri—growing hundreds of strains and varieties in tests to determine their adaptation to Missouri conditions. The valuable knowledge thus gained was widely spread and published so that now Missouri farmers are growing annually 350,000 acres of soybeans for seed and forage and 500,000 acres in combination with corn for hogging down and for silage. Eighty-five per cent of this vast acreage is seeded with the four varieties determined by the experiment station to be best among the hundred tested.

THE experiment station has shown that specially adapted crops can vastly improve the rewards of the Ozark farmer and increase many hundred-fold the possibilities of farming in that extensive and delightful portion of the state. That grain sorghums, Sudan grass and soybeans are the key crops in the Ozark region has been shown by widely scattered experiments. Grain sorghum averaged 25 bushels to the acre, while the best variety of corn grown in comparison yielded only about 5 bushels. Sudan grass yielded 16 bushels of seed and 3 tons of hay to the acre.

But by far the most important results have been with soybeans. The station's discovery of the special adaptation of the Virginia variety was the basis and the beginning of the present wide distribution of this profitable crop in the Ozark region. Many good authorities have said that the introduction of the soybean is the most important development in the history of Ozark agriculture. Where ordinary grasses have long failed to survive and produce sufficient forage for the Ozark farmer's livestock the college is now successfully building rich and hardy pastures with a peculiarly adapted plant—orchard grass. This grass will go far toward solving the Ozark farmer's pasture problem.

Almost without number instances of this sort could be added as further proof of the immense value of the knowledge developed by this great scientific institution. Its field of service is as wide as agriculture itself—including animal husbandry, dairying, poultry raising, farm economics, farm engineering, etc., but greatest of all its services is the discovery of the sound and practical principles of soil conservation and the most efficient utilization of soil wealth.

* * *

Agricultural Programs

(*From page* 19)

Agriculture, Farm Bureau Federation, and the agricultural and marketing committees of the Alabama Bankers' Association. The program contains eight main points. They include a recommendation that the crop acreage on each farm be distributed so as to result in the growth of only so many acres of cotton as can be fertilized and handled properly under existing boll-weevil conditions and scarcity of labor; and the development and maintenance of soil fertility to such a degree as will result in profitable acre yields. Soil fertility is discussed at length,

and the suggestions end with the statement, "from any and all points of view, the matter of soil fertility is, with the Alabama farmer, a most vital consideration, and one which must be met very soon if we are to stay in the farming business."

A preliminary agricultural program for Western North Carolina was adopted at a big sectional meeting late in December, 1925. In addition to farmers from 14 counties, this meeting was attended by all the county agents from that part of the state and by specialists from the State College of Agriculture.

Committees were appointed at the opening of the meeting to study in detail various parts of the program. The reports of these committees were presented to the entire group and adopted as the program. The section devoted to soil fertility takes up the need for growing legumes first. It also says in regard to commercial fertilizers that only 0.91 tons are used per farm in that section. This is too small an amount for the soils to bring the greatest profit. The exact amount to be used depends upon the soil and the crops to be grown. For truck crops it says 500 to 2,000 pounds per acre can be used at a profit. A mixture known as 8-5-5 is mentioned for this purpose.

MANY ideas and plans are being used in the preparation of these agricultural programs. Oregon with its state program made by the Extension Service and followed up by county programs worked out in public conference and, this spring, by a state program for wheat production developed with the help of the farmers, represents one idea.

Virginia with her five-year state program prepared by the state agricultural council and extending to the county programs prepared by county councils represents another viewpoint. Alabama has a program in which organized interests cooperated.

Extension, Experiment Station and College workers prepared a tentative program for Arkansas which is to be acted upon by the farmers. Up in Washington they are developing state programs for each enterprise in state conferences. Full information about the enterprise is collected and printed beforehand for the use of the conference.

Connecticut is studying the needs of each producing region and is developing her program by regions. Colorado probably opened the way for this idea with the outline of her state agriculture followed by regional conferences to apply the information.

South Dakota's program was worked out by the state specialists and approved by state agencies representing all interests. Western North Carolina used the conference method of deciding upon a program. The New Orleans trade area survey is the basis for programs for Louisiana and Southern Mississippi. North Dakota has published a description of the agricultural regions of the state which furnishes the background material for further work.

New Jersey and Tennessee each have at least one county with a program, and county surveys have been made in Pennsylvania which have the effect of county programs. Surveys in West Virginia and Georgia have the effect of regional programs. Idaho is making a state survey to be the basis for a program and other states are working on the preliminary information.

Altogether a goal for agriculture and a survey road for it to travel are becoming realities for the agriculture of a large part of the United States.

Corn Economics

(*From page 24*)

was sound for the continuous culture of corn. This shows an increase of 26.2 bushels of corn per acre and 32.2 per cent more sound corn in favor of corn grown in a rotation.

Where a complete fertilizer of nitrogen, phosphoric acid and potash was applied there was an average yield of 76.5 bushels of corn per acre 89.1 per cent of which was sound when grown in the rotation; and 57.8 bushels, 78.3 per cent. of which was sound when produced under continuous culture methods. This indicates a gain of 18.7 bushels of corn per acre, and an increase of 10.8 per cent in soundness for corn grown in a rotation even though a complete fertilizer was applied in both systems of culture.

Fertilizers alone will not produce maximum yields of corn. Some attention must be given to the rotation. In this case it means 18 bushels more per acre and 10 per cent increase in soundness. Corn land must be thrown into a sod, a deep rooted crop, and a legume occasionally if maximum yields are to be obtained. These conditions may be accomplished in one or more crops. A crop like alfalfa makes a sod, a deep rooted crop, and is a legume. Instances have been reported where corn following alfalfa produced 100 bushels of shelled corn per acre.

A crop rotation should be given considerable thought in the making, bearing in mind, the soil, markets and labor available. A good rotation adds stability to farming, increases yields and reduces risks.

Application of 125 pounds of nitrate of soda per acre on corn grown in the rotation mentioned produced 44.1 bushels, 65 per cent of which was sound, and gave a net return of $43.11 per acre above the cost of fertilizer, labor for applying, and interest on investment. Corn without any fertilizer produced 43 bushels per acre and was 61 per cent sound with a net return of $49.27 per acre. Applications of 250 pounds of acid phosphate per acre produced 43.1 bushels of corn, 64 per cent sound, and gave a net gain of $49.18 per acre. The addition of 75 lbs. of muriate of potash per acre gave a yield of 55 bushels of corn, 73 per cent of which was sound, and a net gain of $58.23 per acre above the cost of the fertilizer investment and application.

Where combinations of two fertilizer materials were applied the acid phosphate—potash combination produced the most satisfactory results. This combination produced 70.5 bushels of corn, 87 per cent of which was sound, and a net gain of $72.26 per acre. A complete fertilizer produced 76.5 bushels of corn, 89 per cent of which was sound, and a net gain of $74.28 per acre.

Muriate of potash alone or in a mixture for corn increases the yield, quality and net returns. Muriate of potash makes the grain and under conditions such as these the first investment should be made in potassic fertilizers or in mixed goods with a high percentage of potash. Potash creates a favorable medium for the growth of red clover in the rotation following wheat and there is doubtless some indirect beneficial effects of this increased clover growth upon the yields of corn that follow.

* * *

ONE ON POP

Willie: "Say, pop, did you go to Sunday school when you were a boy?"

Father: "Yes, regularly. Never missed a Sunday."

Willie: "Well, I'll bet it won't do me any good either."—*Ex.*

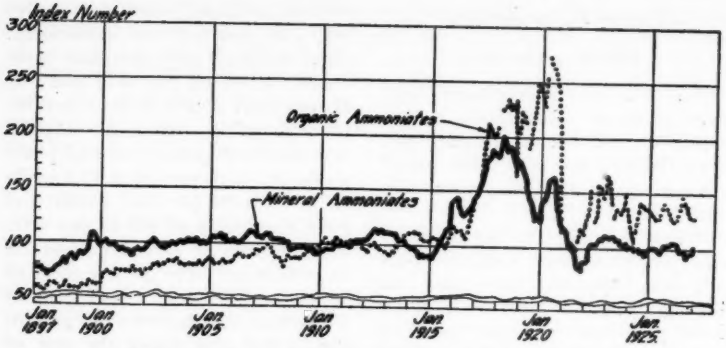


Fig. 2. Index numbers of prices of mineral and organic ammoniates. Mineral ammoniates are now much cheaper than organic ammoniates.

Fertilizer Prices

(*From page 9*)

cause—"Farm prices increased more rapidly than the general price level, so that the purchasing power of farm products in terms of fertilizer materials increased. That is, there was an increase in the amount of fertilizer materials that could be purchased with a pound of cotton, tobacco, potatoes, or corn."

Referring to some of the more important fertilizer materials, the prices for organic ammoniates has averaged 133 per cent pre-war while the mineral ammoniates are lower. The index number of acid phosphate in 1926 was 112, while farm prices in the United States were 143. Wholesale prices of all commodities in the United States were 154.

Potash prices have averaged only 83 per cent of pre-war for the five years, 1922-1926. In this same period very few commodities sold for less than pre-war average price; in fact, of 24 important agricultural commodities, only two (barley and horses) sold for less than pre-war average price.

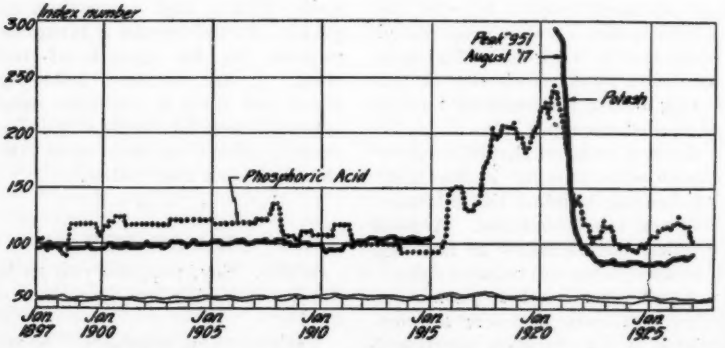


Fig. 3. Index numbers of prices of potash and phosphoric acid. Potash prices are below pre-war, while phosphoric acid prices are slightly above.

Therefore, during recent years one of the striking and important features of the fertilizer situation has been relatively low prices of fertilizer ingredients.

Five tables are included, giving the index numbers of different materials each month since 1897 to December, 1926. These tables include the index number of prices of 12 fertilizer materials; the index numbers of prices or organic ammoniates; of mineral ammoniates, of phosphoric acid, and the index numbers of prices of potash. These are probably the most complete series of index numbers of prices of fertilizer materials yet prepared.

The author concludes with the statement that "for the 5 years, 1922-1926, organic ammoniates average 133 per cent pre-war; phosphoric acid 106 per cent; mineral ammoniates 100 per cent, and potash 83 per cent pre-war. Potash has been consistently cheaper than the other fertilizer ingredients."

The significance of this research is that the present can only be safely interpreted in the light of the past. Stabilization and the elimination of fluctuations being one of the chief aims of agricultural progress, this is an important contribution on one of the factors vitally affecting such stabilization.

The more important comparisons discussed in this article are shown in the three cuts.

* * *

Testing for Diplodia Rot

(*From page* 44)

moist and drying slowly. Seed corn should be dried thoroughly and rapidly. There is no doubt that the diplodia mold is the most destructive disease of corn known at this time. And that is exactly the reason, Mr. Mikkleson, why it would pay you to carefully test your corn this winter."

"Mebby,—kinda looks that way," said Mikkleson.

"Chore time, let's go home," said Larson, "but do you want to sign up before we leave."

"Well let me—if you get Bill Smith signed first, then I'll sign. Not quite ready . . . yet. The Farm Bureau ought to do something first before they try to get members."

"Watch that fellow," said the county agent when they left, "he will likely test his corn this winter and next year he will tell his neighbors how 'HE'D farmed for over 40 years and made money without any help from the Farm Bureau.'"

* * *

Improving Seed

(*from page* 27)

in a separate plot in the field with his general crop in October, 1925.

A fertilizer analyzing 4 per cent ammonia, 16 per cent phosphoric acid, and 4 per cent potash was used at the rate of 200 pounds per acre on his crop, the head selected one-sixth acre included. On June 14, 1926, just before cutting, the head selected wheat was taller and appeared to be better headed than his general crop. It was very fine and clean. Mr. Altaffer said that the growth of the head selected wheat was more vigorous than the general crop and the sheaves were noticeably heavier. The one-sixth acre yielded at the rate of 48 bushels per acre against 35 per acre average for his general crop.

Late last September Mr. Altaffer seeded 3½ acres from this selected seed using 200 pounds per acre of a fertilizer analyzing 4 per cent ammonia, 16 per cent phosphoric acid, and 4 per cent potash. He hot-water treated it for disease before seeding.

Orchard Grass in Missouri

(*From page 26*)

A somewhat novel yet very practical method is used in seeding orchard grass with wheat. Being light it is very difficult to seed alone by any mechanical means. Very successful results are obtained by mixing the grass seed with the grain and drilling the two in the one operation. Orchard grass is without question a wonderful crop.

* * *

Treasure of the Wild

(*From page 22*)

Twelve farms are now established in the mountains of San Bernardino county where the winter temperature of 10-15 degrees below zero is well suited to the industry.

One company has a wide clientele among the motion picture people of Hollywood. This concern sells its registered stock at $2,500 per pair and, if the purchaser desires, keeps the animals at the farm and charges $200 per year for their food and care, with an additional $50 a year for the care of each whelp. The company guarantees to replace the adult animals if they die during the first year.

The prices quoted for these animals cease to seem exorbitant when it is considered that this fur has been the highest priced fur on the market for several hundred years and that it is estimated by experts that the market of the United States could handle 100,000 silver fox skins annually and the European market 150,000 more. As there are but 80,000 of these animals in existence, under the most favorable circumstances the supply could not meet the demand for 20 or 30 years.

MISTAKEN IDENTITY

Flapper: "I'd like to try on that rose dress in the window.

Salesman: "Sorry, Miss. That's a lampshade."

A lamb with a tail gets docked in price when it gets to market. Therefore good shepherds dock the tail, which is rather a useless article anyway. Here are some California Smith-Hughes students docking lambs with equipment made by them in their farm work shop.

Unbending Backs in Farming

(*From page* 13)

The development of engine gang plows has taken place since the beginning of the twentieth century. No one man can be given credit for any important step in the development of the engine gangs, for it was rather the work of many minds, impressed all at once with a new, swift-arising situation. Progress has been made, from several plow bottoms, held rigidly in a single frame, to the hand-lift types.

For nearly a century after James Watt invented the steam-engine, which was in 1765, steam did little of importance to relieve man's heaviest task, that of turning over the soil each year to produce a crop. That there was a great effort made to substitute iron energy for the horse's muscle is evident by the number of patents filed.

About 1850, mechanical power was applied to plowing in England. A portable steam-engine and a windlass were used to wind up a cable, which was attached to a balance plow. Due to the high cost of the cable, and the clumsiness of the tackle, the plan was impractical.

As early as 1870, the natives of Kansas were much surprised to see an upright steam traction engine pulling several horse plows. Most of the plowing ventures involving engines ended in a failure, for engines were primarily designed for belt work rather than for pulling. Hitching a sufficient number of horse plows to an engine to use the available power proved to be cumbersome, particularly in turning. No saving of labor was possible, either, on account of the number of men necessary to drive the engine, control the plows, and drive the water wagon. Steam-plowing continued to be regarded as an extravagant and impractical fad, until the beginning of the twentieth century, when the demand became so insistent that manufacturers were forced to comply with it. With improved equipment, skilled operators, steam-plowing reached so high a point of efficiency that huge prairies were conquered at a remarkable speed.

Because of the scarcity and high price of labor and coal, and a need for small motors, the demand for the gas tractor arose. The tractor, today, stands ready for hard and efficient service in less than half the years that it took to make the steam-engine plow merely practical.

The gas tractor or the multiple hitching of horses comes nearer to solving the problem of plowing than steam on account of economy in small units, the convenience of handling and general efficiency.

In 1876, men and animals produced practically the only power used in farm work. Oxen were the standby for plowing.

Today, power and modern equipment distinguishes American agriculture from that of the old world. The tractor sometimes replaces the horse that displaced the oxen and the farmers often broken and bent from the struggles with the labor of plowing may have the freedom to farm by mental force rather than physical.

Mechanical power has added millions of bushels yearly to the prairie and put countless numbers of prosperous towns on the map. The man with the hoe is passing.

From the war club of the first

tiller of the soil to the steel plow of today is a far step in the development of civilization, but still greater is the gap between the plow factory of today and the laborious task of the savage who first shaped a pointed weapon by rubbing one stick upon another on a stone. When animals were harnessed to the plow, the peasant was free from the hardest work of all to use his mind in devices and plans for greater learning. Civilization and the plow have gone together. Fitting it is that the United States government should place the plow prominently in its government seal.

* * *

Better Muck Crops

(*From page* 8)

Where fertilizer other than potash is needed a good practice is to use about 400 lbs., of a mixture containing 8 to 12 per cent phosphoric acid and 12 to 20 per cent potash.

In the fertilization of grasses on peat and muck lands good results have been obtained from application of about 400 lbs., per acre of a mixture containing 8 to 12 per cent phosphoric acid and from 12 to 32 per cent potash.

Peppermint and spearmint are very important muck soil crops which respond profitably to intelligent fertilization. Experiments of the United States Department of Agriculture show that from 150 to 200 lbs., per acre of muriate or sulfate of potash on high-lime mucks not only provides the necessary potash but to a certain extent controls a plant disease called chlorosis. Under average soil conditions practical farmers have obtained excellent results from use of 300 to 400 lbs., per acre of a 2-8-16 analysis.

The sugar beet crop gives promise of being one of the most important cash crops on muck lands. Results of experiments given below show clearly that potash is highly profitable for this crop.

	No fertilization	100 lbs. Sodium Nitrate 250 " Acid Phosphate	100 lbs. Sodium Nitrate 200 " Acid Phosphate 200 " Mur. of Potash
Yield	3.5 tons	4.5 tons	16.2 tons
% sugar	10.8%	11.2%	16.2%

Peat and muck soils are especially suitable for vegetable crops, the most important of which are potatoes, onions, cabbage and celery.

Potatoes thrive on both high-lime and low-lime soils. Because of danger from potato scab on soils rich in lime the low-lime soils are considered best. This crop is a heavy feeder on potash and heavy applications must be made if best results are to be obtained.

The world's record crop of potatoes (1038.3 bushels) was grown on one acre of muck soil in California in 1926. The fertilizer used in making this record was a 0-23-24, the potash from sulfate of potash, and the rate of application one ton per acre.

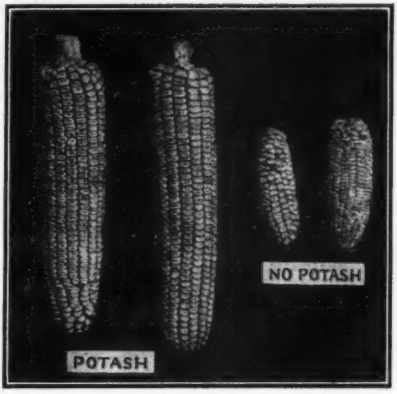
In another test the following results were obtained:—

Treatment	*Early Ohio*	*Rurals*
0	32.3 bu.	31.6
400 lbs. 0-8-24	136.0 bu.	151.4

Onions are extensively grown on muck soils and best results are obtained only where proper attention is given to fertilization. Mixtures containing from 8 to 12 per cent phosphoric acid and 10 to 24 per cent potash are recommended, the most successful growers using about 1,000 lbs., per acre

of this mixture.

The cabbage crop is a heavy feeder and liberal applications of commercial fertilizer pay. This crop does not have a high acre value and must, therefore, be fertilized with special regard to high yields and quality.



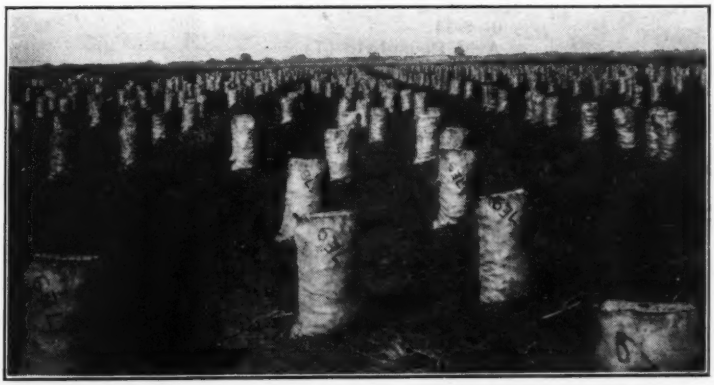
In an experiment on a muck farm in Indiana where 500 lbs., of a 2-7-10 fertilizer were used the yield of cabbage was 18.4 tons per acre, while on the same farm where no fertilizer was used the yield was only 12.8 tons. The fertilized plot invariably gave larger yields and better quality than the unfertilized.

THE celery crop has a higher acre value than most muck land crops and can, therefore, be fertilized heavier. Potash alone on this crop frequently produces excellent returns but the most successful farmers advocate using a complete fertilizer. The following table shows results of an experiment with celery on the farm of C. E. Downing, Eaton county, Mich.

Treatment		*Yield*
0		252 crates
1,000 lbs. per acre	2-7-0	457 "
" " " "	2-7-10	569 "

The net gain from use of potash in this experiment (valuing celery at $1.00 a crate) was $106.00.

For the benefit of those who may be interested, the following list gives the latest recommendations of the various state experiment stations for fertilizing peat and muck soil crops. It will be noticed that the recommendations are given for both high-lime peats and mucks and low-lime peats and mucks, thus making it possible to select the analysis best suited to either.



A former world's record potato crop (962.5 bushels from a measured acre) grown on San Joaquin, California, peat soil

STANDARD GRADES OF FERTILIZER RECOMMENDED IN VARIOUS STATES FOR PEAT AND MUCK SOILS

(See numbered footnotes for explanations)

Crop	High-lime peats (2) peaty sands, and mucks		Low-lime peats, (3) peaty sands, and mucks	
Alfalfa	Muriate of Potash (6)		Not adapted	
	0- 8-24	0-10-10		
	0-12-12			
Barley	0-12-12	0-12- 6	2-10-10	2-12- 6
	0- 8-32		2- 8-16	0- 8-24
Beets (4)	0-12-12	0-12- 6	Not adapted	
	2-10-10			
Buckwheat	Muriate of Potash (6)			
	0- 8-24	2- 8-16	3-12-12	
	0-12-12	2-10-10	4- 8-10	
Cabbage (4)	Muriate of Potash (6)			
	0- 8-24	2- 8-16	3-12-12	
	0-12-12	2-10-10	4- 8-10	
Carrots (4)	Muriate of Potash (6)			
	0- 8-32	2- 8-16	3- 8-24	3-12-12
	0- 8-24		2- 8-16	
Celery (4)	Muriate of Potash (6)			
	4- 8-10			
	0- 8-24	2- 8-16	Not adapted	
	0-12-12	2-10-10		
Corn	Muriate of Potash (6)		0- 8-24	3-12-12
	0-10-10	0- 8-32	0-12-12	
	0- 8-24	0-12-12	2- 8-16	3- 8-24
Clover (4) (ex. Crimson)	Muriate of Potash (6)			
	0- 8-24		Poorly adapted	
	0-12-12		0-12-12	
Cranberries (5)	Not adapted		5-12- 6 (8)	
Cucumbers	0- 8-24	2- 8-16	3-12-12	2-12- 6
	0-12-12	2-10-10	4- 8-10	4- 8-10
Cauliflower (4)	Muriate of Potash (6)			
	0- 8-24	2- 8-16	Not adapted	
	0-12-12	2-10-10		
Flax	Muriate of potash (6)		0-12-12	
	0- 8-24			
	Acid Phosphate (7)			
Grass hay (timothy)	Muriate of potash (6)		3- 8-24	
	0- 8-24	0- 8-32	3-12-12	
	0-10-10		2-12- 6	
	Acid Phosphate (7)			
Lettuce (4)	2- 8-16	4- 8-10	Not adapted	
	2-10-10	2-12- 6		
Mangels	Muriate of potash (6)			
	0- 8-24	2- 8-16		
	0-10-10	2-10-10	Not adapted	
		0- 8 32		
Millet	Muriate of potash (6)		3- 8-24	
	0- 8-24	0- 8-32	3-12-12	
	0-10-10		3-12-16	
Mint	2- 8-16			
Oats	Muriate of potash (6)		2-12- 6	2- 8-16
	0- 8-24	0-12-12	3-12- 6	0- 8-24
	0-10-10		3-12-12	

Onions	0- 8-24	2- 8-16	Not adapted	
	0-10-10	2-12-12		
Parsnips (4)	Muriate of potash (6)			
	0- 8-24		Not adapted	
	2- 8-16			
Pasture	Muriate of potash (6)		2- 8-16	0-12- 6
	0- 8-24	0- 8-32	3-12-12	2-12- 6
	0-10-10	0-14- 4	Acid phosphate (7)	
	Acid phosphate (7)			
Peas	0-12-12			
	0- 8-24			
Peppermint	0- 8-24			
	2- 8-16		Not adapted	
Potatoes	0- 8-24	0- 8-32	3- 8-24	3-12-12
	0-12-12	2- 8-16	2- 8-16	
Radishes	0- 8-24	2- 8-16	2- 8-16	4- 8- 6
	0-12-12	3-12-12	3-12-12	
Rape	0- 8-24		2-12- 6	
	0-12-12		3-12-12	
Rye	0- 8-24		0- 8-24	3-12-12
	0-12-12		2-12- 6	2- 8-16
Spinach (4)	0- 8-24	2- 8-16	Not adapted	
	0-10-10	2-12- 6		
Sugar beets (4)	0- 8-24	0- 0-50		
	0- 8-32	0-12-12	Not adapted	
	0-10-10	0-10-20		
Sunflowers	Muriate of potash (6)		3- 8-24	3-12-12
	0- 8-24		0-12-12	2- 8-16
	0-12-12	0- 8-32		
Strawberries (5)	Poorly adapted		3-12-12	5- 8- 6
			2-12- 6	
Sweet corn	Muriate of potash (6)		3-12-12	2- 8-16
	0- 8-24	0-12-12	4- 8-10	
Sweet clover (4)	Muriate of potash (6)		Not adapted	
	0- 8-24	0- 8-32		
	0-12-12			
Turnips	Muriate of potash (6)		2-12- 6	3-12-12
	0- 8-24	0-12-12	2- 8-16	3- 8-24
	0- 8-32			
Wheat	0-12-12		3-12-12	0- 8-24
			2-12- 6	

(1) The figures given represent percentage of ammonia, phosphoric acid, and potash respectively. Rate of application is governed by value of the crop, ranging from 200 lbs. per acre for pasture and hay to 4,000 lbs. for onions and celery.

(2) High-lime peaty soils are usually more desirable than low-lime for most crops. (See list high-lime crops).

(3) Low-lime peaty soils require lime except for crops that will stand a little acid. (See list low-lime crops).

(4) These crops are high-lime crops.

(5) These crops are low-lime or acid-loving.

(6) Muriate of potash or other forms of potash alone, where nitrogen and phosphoric acid are not needed.

(7) Acid phosphate alone where the soil is very low in this plant food.

(8) Cir. 144—N. J. Exp. Station (75 lbs. sodium nitrate, 75 lbs dried blood, 300 rock phosphate, 50 lbs. sulfate of potash, with 300 lbs. acid phosphate first year.)

Duplication

(*From page* 4)

to set forth on a sales trip to sell the product of his own hands, offered to carry also (on a commission basis, probably!) a few shirts made by a neighboring shirtmaker, and thus established for the first time in the world a *distributor*—has grown, amplified, and extended its tentacles so far that it bids fair soon to throttle us!

Where is the limit? How many of everything can a working nation like ours support?

Somewhere between *one* grocery store and a *hundred* lies a sensible mean that intelligence tells us should be established in a community of twenty thousand—somewhere between one and ten hotels and between one and five railroads to the next city.

At the beginning of our "commercial age" the great fortunes were made by manufacturers who, from crude materials, fashioned artfully those needs and luxuries a growing population demanded.

Money was made so quickly that little thought was given to efficiency or to the elimination of waste; until, during the last two decades, those who *reclaimed waste* or *increased efficiency* became the fortune makers.

And through this reduction of waste and improved efficiency came higher wages, increased purchasing power—new demands, louder cries for more things to buy.

In our anxiety to turn out needs and luxuries to satisfy this husky, growing appetite we have forgotten—most of us—to take note of how the things we manufactured or grew were delivered to our customers.

Now that we take breath and begin to analyze our distributive system we discover to our horror that it has grown so immensely and become so complicated that a pair of shoes which leaves the factory at three dollars must, after travelling our distribution channels, cost the wearer *six* dollars when he takes them home.

He is buying three dollars worth of shoes—and three dollars worth of "get-'em-there"!

A typewriter ribbon which the government at Washington buys for 11c. on specification, costs *me* 75c. over the counter of a retail stationery store. To the eleven cents the government pays is added, before I can have the ribbon, a *tax* of 64 cents—*over six times the manufacturing cost*—to cover advertising, broker's profits, the overhead expense of the wholesaler's establishment, his salesman's salary, the profit of the retailer, his expense and the salary of the clerk who wraps it for me.

The man who finds a way to get me that ribbon for even 22 cents or twice what Uncle Sam pays, will make a fortune.

A PENNY'S worth of corn, when rolled into breakfast flakes, advertised and placed in a fancy advertised carton in my grocer's delivery basket costs me just fifteen cents. Where did the other fourteen cents go? And why? How did its expenditure improve the nourishment in my penny breakfast which cost me fifteen cents?

The fortunes of the next two decades will be made by those who learn now to cut the costs of distribution, and to eliminate senseless duplication.

The costs of distribution, in my opinion, cannot be lowered appreciably, until the curtain is rung down on the tragedy of duplication; for it is duplication which piles up costs.

Men have not yet learned to let one experience serve for all. Each still insists on having his own. The

result is that our advancement is slowed, our pace halted.

The tragedy of duplication is found in every walk of life, in every business, in every industry —even on every farm.

Three farmers on the same road, each cultivating a hundred acres, will each buy a plow, use it two weeks in the year—and let it rust the balance of the time. Yet would they but "pool" their farms and agree cooperatively to work the combined three hundred acres, but one plow would be needed, and profits for all of the trio thus increased.

Duplication is *vexation.*

And we all must pay our share of its inane tax.

A FEW years ago a thoughtful young man noted that every wholesale druggist issued monthly a sales bulletin to the retail druggists in his community. Gathering samples of these bulletins from each great city in the country, this young man discovered that they were almost duplicates.

As all the wholesale druggists sold practically the same goods, he proposed that each discontinue his individual bulletin and adopt one which could be prepared once in a central headquarters and then issued identically each month in each city, merely changing the name on the cover.

It was done. And immediately each wholesaler saved from five to ten thousand dollars a year; and in addition, was able to liberate to more useful work several men whose former duty it had been to create and produce the local bulletin.

Following the lead of the wholesale druggists, the wholesalers in thirty other fields have gradually adopted this plan—until today the savings which have been made from this single idea mount up into the millions.

And these savings are already beginning to be reflected in the downward price of merchandise to you and to me.

To eliminate duplication is to release new money—to increase purchasing power.

To continue is tragedy.

For when, in many instances, the duplication has been unwisely permitted, nothing can reconvert into more useful things the material so invested.

If, for example, we permitted twenty railroads to lay tracks abreast between Chicago and New York, no merger or other later mental move could turn back into useful dollars the labor and steel frozen into the nineteen useless, extravagant tracks and roadbeds.

If already five hotels serve us, to merge the capital and management will not aid nor decrease future expense a great deal, for the hotels are *built.* The labor, bricks and equipment are *there forever.*

That is the *real* tragedy of duplication.

Like many other kinds of mistakes, there is no salvage—the nail *hole* remains though we remove the nail.

Future generations will glance back over their shoulders at us and wonder how we ever permitted a "system of fair competition" to so successfully blind our economists that they could not see the woful waste in that system?

And they will, with a sigh, assume on their weary backs, the burden which we today are piling up bit by bit, stone by stone, store by store, factory by factory, in the knapsack of future generations.

When will we as a nation learn through unanimous action to ring down the curtain on this dreadful tragedy of duplication?

OUT OF STYLE

A young doctor has prescribed castor oil for the baby.

"But, Doctor," protested the young mother, "castor oil is so old-fashioned!"

"Madam," replied the Doctor, "babies are old-fashioned things."—*Cornell Widow.*

Motorist (changing tire): Muscle Shoals!

Passer-by: Why Muscle Shoals?

Motorist: It's the biggest dam I know of.—*Exchange.*

CONSOLATION

"Well, Mrs. Johnson," a colored physician announced, after taking her husband's temperature, "Ah has knocked de fever outen him."

"Sho' nuff," was the excited reply. "Am he gwine git well, den?"

"No'm," answered the doctor. "Dey's no hope fo' him, but you has de satisfaction ob knowing dat he died cured."—*American Legion Weekly.*

"Next," called the barber, and a flapper, be-rouged and with stockings rolled low, took her seat in the chair.

"What'll it be?" asked the man with the shears.

"Shingle—high up," replied the flapper.

"She needs a shingle all right, but it should be applied lower down," sniffed the old-fashioned man, in a loud aside.

PAGE MR. VOLSTEAD

One of our men recently attended a lecture given in the interests of prohibition with which he was not in entire sympathy. In fact, he was so little in sympathy with the matter that he interrupted the speaker on several occasions. One time the speaker said: "If I led a donkey up to a pail of water and a pail of beer, which will he choose to drink?" and our friend interjected, "The water." "Yes, and why?" said the lecturer. "Because he is an ass," was the prompt reply.

"I envy the fat woman when she laughs."

"Why?"

"There seems to be so much of her having a good time."

MAMMA LOVES PAPA

The teacher asked little Ruth what her father's name was.

"Daddy," she answered.

"Yes, dear," said the teacher, "but what does your mother call him?"

"She don't call him nuthin'," Ruth answered earnestly. "She likes him."

MIXED BRANDS

"Daddy, why is that man running up and down the smoking car with his mouth open?"

"My son, that is a Scotchman getting a free smoke."—*Colgate Banner.*

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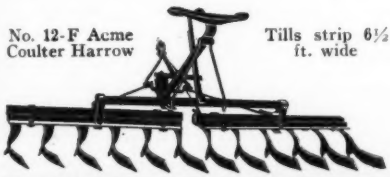

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The scientific character of this book and the practical application of its contents to observations of the growing crops make it valuable to research workers in soils and fertilizers. We will gladly send it to such workers upon request as long as our small supply will permit.

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Stop these tobacco spoilers

THERE are certain diseases of tobacco which can only be stopped by early prevention measures.

If you wait until the growing season is advanced and warning signs appear, it will then be too late, for these diseases are due to faulty feeding and the remedy must be applied before the plants start growing.

Chief of these is sand drown which causes the leaves to lose color and turn pale yellow. It begins at the tip and edges of the leaf and spreads towards the center. The cured leaf has a dull, faded appearance and is shunned by buyers.

Sand drown is due to a shortage of magnesium in the soil and can easily be stopped by using a fertilizer mixture containing sulfate of potash-magnesia, which contains both magnesia and potash in the right proportions to give best results.

Wherever black root rot has been noted, you should avoid fertilizers that promote an alkaline condition of the soil and see that the potash in your fertilizer is derived from sulfate of potash, especially if the soil has been heavily limed recently.

It is within your power to prevent both sand drown and black root rot, to increase your yields and improve your quality by using the right kind and amount of plant food in your fertilizer. The right form of potash pays!

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